

✓*	SHEET NO.	TITLE	APPROVAL DATE**
	HW-211_01	ANTI-TRACKING PAD	11-09-22
✓	HW-286_01	DRAINAGE TRENCH EXCAVATION	11-09-22
	HW-505_01a	STRAIGHT ENDWALLS	01-21-25
	HW-505_01b	STEEL REINFORCING FOR STRAIGHT ENDWALLS (2" DIFF BASE TO FLOW LINE)	01-05-24
	HW-505_01c	STEEL REINFORCING FOR STRAIGHT ENDWALLS (STANDARD RIPRAP APPLICATION)	01-05-24
	HW-505_02	TYPE "D-G" & "L" ENDWALLS	01-05-24
✓	HW-586_01	CATCH BASIN AND DROP INLET TYPES "C" AND "C-L" STRUCTURES	01-05-24
	HW-586_02	CATCH BASIN ( TYPES "C" AND "C-L" ) FOR DOUBLE GRATE TYPE I STRUCTURES	01-05-24
	HW-586_03	CATCH BASIN ( TYPES "C" AND "C-L" ) FOR DOUBLE GRATE TYPE II STRUCTURES	01-05-24
	HW-586_04	PRECAST CATCH BASIN AND ROUND STRUCTURE	10-17-24
	HW-586_05	PRECAST CATCH BASIN TYPES FOR DOUBLE GRATE TYPE I	10-17-24
	HW-586_06	PRECAST CATCH BASIN TYPES FOR DOUBLE GRATE TYPE II	10-17-24
✓	HW-586_07a	CATCH BASIN TYPE "C" AND "C-L" TOPS	01-05-24
	HW-586_07b	CATCH BASIN TYPE "C" AND "C-L" DOUBLE GRATE TYPE I TOPS	11-09-22
	HW-586_07c	CATCH BASIN TYPE "C" AND "C-L" DOUBLE GRATE TYPE II TOPS	11-08-22
	HW-586_07d	CATCH BASIN TYPE "C-G" AND "C-M" BARRIER CURB TOPS	11-09-22
✓	HW-586_08	CATCH BASIN FRAMES AND GRATES	11-09-22
	HW-586_09	CATCH BASIN LOCK DOWN TOPS	11-09-22
✓	HW-586_10a	MANHOLE FRAME AND COVER	01-05-24
	HW-586_10b	MANHOLE FRAME AND GRATE	01-05-24
	HW-586_10c	REINFORCED PRECAST CONCRETE MANHOLE	11-08-22
	HW-586_10d	MANHOLE NON-PRECAST CONCRETE UNIT	11-08-22
	HW-686_01a	CONCRETE PIPE CONNECTION SHEET 1	11-08-22
✓	HW-686_01b	CONCRETE PIPE CONNECTION SHEET 2	11-08-22
	HW-686_02a	DRAINANGE PIPE ENDS SHEET 1 [ CORRUGATED METAL PIPE ]	11-08-22
	HW-686_02b	DRAINAGE PIPE ENDS SHEET 2 [ CONCRETE PIPE ]	11-08-22
✓	HW-751_01	UNDERDRAINS AND UNDERDRAIN OUTLETS	10-17-24
	HW-803_01	PAVED APRONS	11-08-22
✓	HW-811_01	CONCRETE CURBING	11-08-22
	HW-813_01	GRANITE STONE TRANSITION CURBING	11-08-22
	HW-813_02	STONE CURBING	11-08-22
	HW-815_01	BITUMINOUS CONCRETE CURBING	11-08-22

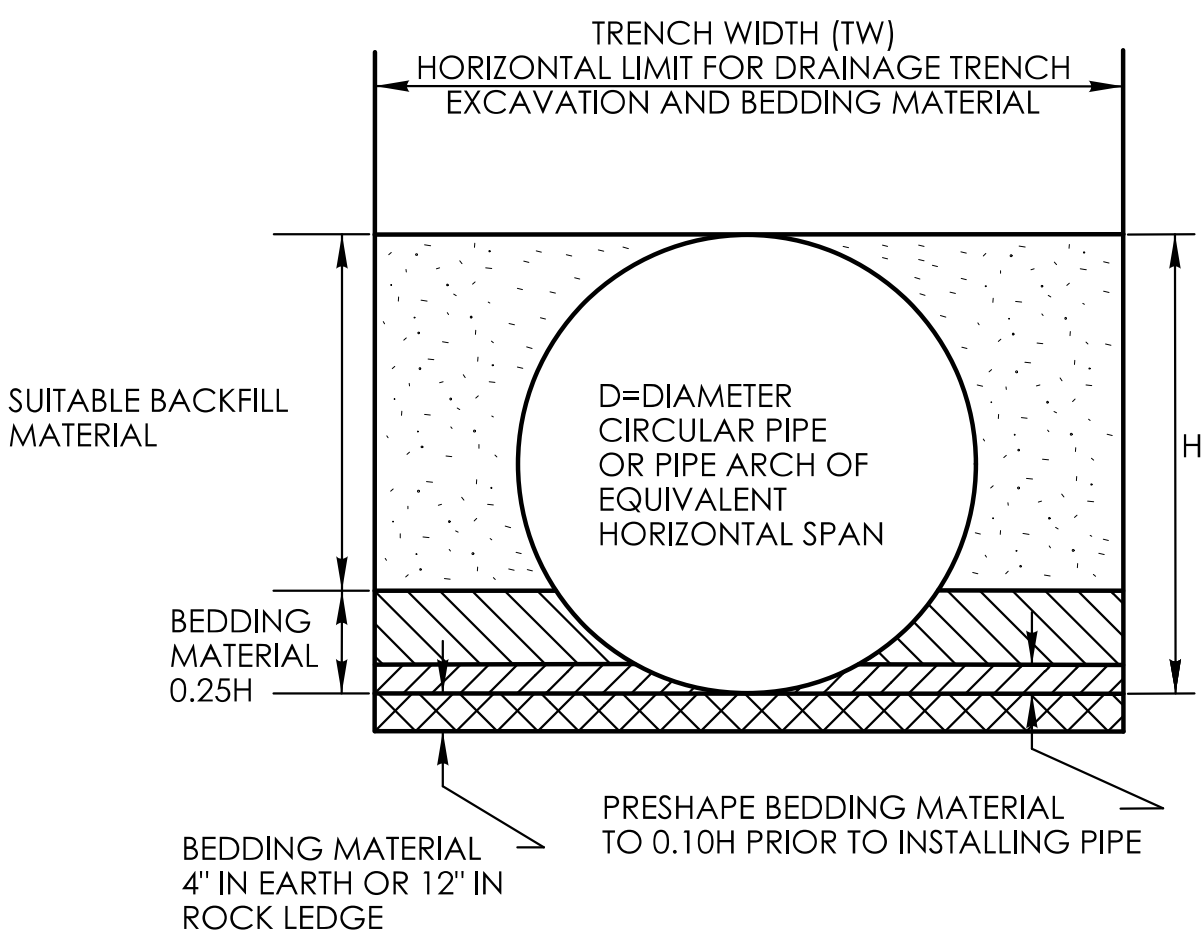
✓*	SHEET NO.	TITLE	APPROVAL DATE**
	HW-821_01a	TRANSITION - 45" F-SHAPE TO 45" VERTICAL SHAPE SHEET 1	11-08-22
	HW-821_01b	TRANSITION - 45" F-SHAPE TO 45" VERTICAL SHAPE SHEET 2	11-08-22
	HW-821_01c	TRANSITION - 45" F-SHAPE TO 45" VERTICAL SHAPE SHEET 3	11-08-22
	HW-821_02a	45" F-SHAPE PRECAST CONCRETE BARRIER CURB SHEET 1	11-08-22
	HW-821_02b	45" F-SHAPE PRECAST CONCRETE BARRIER CURB SHEET 2	11-08-22
	HW-821_03a	TRANSITION - 32" JERSEY SHAPE TO 45" VERTICAL SHAPE SHEET 1	11-08-22
	HW-821_03b	TRANSITION - 32" JERSEY SHAPE TO 45" VERTICAL SHAPE SHEET 2	11-08-22
	HW-821_03c	TRANSITION - 32" JERSEY SHAPE TO 45" VERTICAL SHAPE SHEET 3	11-08-22
	HW-821_03d	TRANSITION - 32" JERSEY SHAPE TO 45" VERTICAL SHAPE SHEET 4	11-08-22
	HW-821_03e	TRANSITION - 32" JERSEY SHAPE TO 45" F-SHAPE	11-08-22
	HW-821_04a	MERRITT PARKWAY NARROW MEDIAN BARRIER	11-08-22
	HW-821_04b	MERRITT PARKWAY - 2' WIDE MEDIAN BARRIER AND ROADSIDE BARRIER	11-08-22
	HW-821_05a	TRANSITION - 45" F-SHAPE TO 54" VERTICAL SHAPE SHEET 1	11-08-22
	HW-821_05b	TRANSITION - 45" F-SHAPE TO 54" VERTICAL SHAPE SHEET 2	11-08-22
	HW-821_06	54" VERTICAL SHAPE BARRIER	11-08-22
	HW-821_07	MISCELLANEOUS DETAILS FOR BARRIER TRANSITIONS	08-20-25
	HW-821_08a	F-SHAPE CONC. BARRIER CURB (21"x45") TRANSITION FOR THRIE-BEAM	10-17-24
	HW-821_08b	F-SHAPE CONC. BARRIER CURB (21"x45") TRANSITION FOR THRIE-BEAM - REINF.	11-08-22
	HW-821_09a	SINGLE SLOPE CONC. BARRIER CURB (20"x42") TRANS. FOR THRIE-BEAM	11-08-22
	HW-821_09b	SINGLE SLOPE CONC. BARRIER CURB (20"x42") TRANS. FOR THRIE-BEAM - REINF.	11-08-22
	HW-821_10a	VERTICAL FACE CONC. (21"x54") TRANSITION FOR THRIE-BEAM	11-08-22
	HW-821_10b	VERTICAL FACE CONC. (21"x54") TRANSITION FOR THRIE-BEAM REINF.	11-08-22
	HW-821_11a	42" SINGLE SLOPE PRECAST CONCRETE BARRIER CURB -SHEET 1	01-05-24
	HW-821_11b	42" SINGLE SLOPE PRECAST CONCRETE BARRIER CURB -SHEET 2	01-05-24
	HW-822_01	TEMPORARY PRECAST CONCRETE BARRIER CURB	11-08-22
✓	HW-822_02a	TEMPORARY TRAFFIC BARRIER - DETAILS	11-08-22
	HW-822_02b	TEMPORARY TRAFFIC BARRIER (BOLTED)	01-23-25
	HW-822_02c	TEMPORARY TRAFFIC BARRIER & TEMPORARY TRAFFIC BARRIER (PINNED)	01-23-25
	HW-905_01	STONE WALL FENCE	11-09-22
	HW-906_01	WIRE FENCE	11-08-22

\*ONLY STANDARD SHEETS MARKED WITH AN " ✓ " ARE IN THIS PROJECT #0115-0122\*\*REVISED OR ADDED

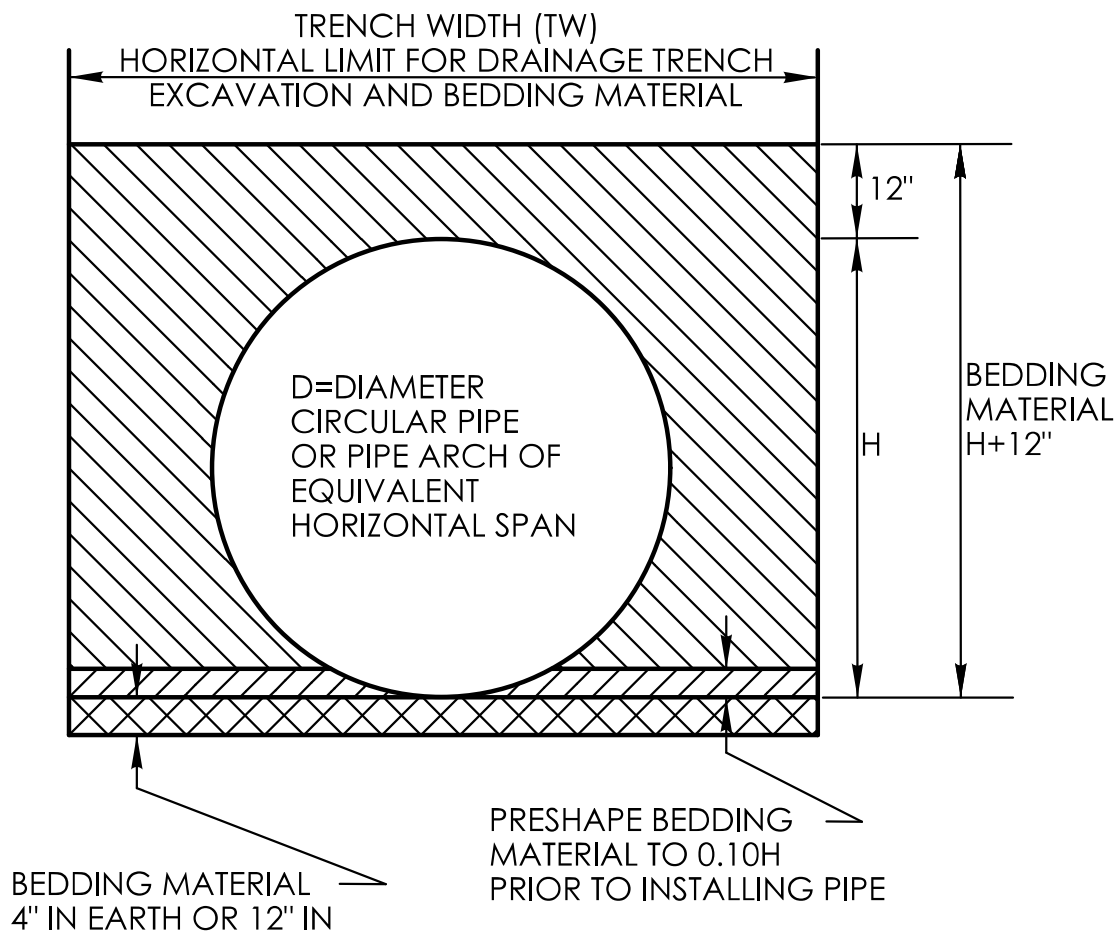
✓*	SHEET NO.	TITLE	APPROVAL DATE**
	HW-910_01	W-BEAM METAL BEAM RAIL HARDWARE	11-08-22
	HW-910_02	METAL BEAM RAIL (TYPE R-B 350) GUIDERAIL	11-08-22
	HW-910_03	METAL BEAM RAIL (TYPE MD-B 350) GUIDERAIL	11-08-22
	HW-910_04	METAL BEAM RAIL (TYPE R-B 350) SYSTEMS 5, 5A, & 6	11-08-22
	HW-910_05	METAL BEAM RAIL R-B 350 SPAN TYPE I, II, III SECTIONS	11-08-22
	HW-910_06	R-B 350 BRIDGE ATTACHMENT SAFETY SHAPE PARAPET	11-08-22
	HW-910_07	R-B 350 BRIDGE ATTACHMENT VERTICAL SHAPE PARAPET	11-08-22
	HW-910_09a	MISCELLANEOUS GUIDERAIL TRANSITIONS SHEET 1	11-08-22
	HW-910_09b	MISCELLANEOUS GUIDERAIL TRANSITIONS SHEET 2	11-08-22
	HW-910_10	METAL BEAM RAIL 8" x 6" BOX BEAM	11-08-22
	HW-910_11	CURVED GUIDERAIL TREATMENT DETAIL	11-08-22
	HW-910_12a	MERRITT PARKWAY GUIDERAIL LEADING END ATTACHMENTS AND SYSTEMS 2&3	11-08-22
	HW-910_12b	MERRITT PARKWAY GUIDERAIL HARDWARE DETAILS	11-08-22
	HW-910_12c	MERRITT PARKWAY GUIDERAIL TRAILING END ATTACHMENTS	11-02-22
	HW-910_12d	MERRITT PARKWAY MEDIAN GUIDERAIL AND END ANCHOR	10-17-24
	HW-910_13a	THRIE-BEAM METAL BEAM RAIL HARDWARE	11-08-22
	HW-910_13b	THRIE-BEAM TRANSITIONS	11-08-22
	HW-910_14a	THRIE-BEAM 350 BRIDGE ATTACHMENT	11-08-22
	HW-910_14b	THRIE-BEAM 350 GUIDERAIL TRANSITION TO R-B 350 GUIDERAIL	11-08-22
	HW-910_15	MD-B 350 MEDIAN BARRIER SAFETY SHAPE ATTACHMENT TYPE I	11-08-22
	HW-910_16	MD-B 350 MEDIAN BARRIER SAFETY SHAPE ATTACHMENT TYPE II	11-08-22
	HW-910_17	R-B TERMINAL SECTION	11-08-22
	HW-910_18	METAL BEAM RAIL (TYPE MD-I) GUIDERAIL	11-08-22
	HW-910_19a	METAL BEAM RAIL (MODIFIED TYPE R-I) AND END ANCHORAGE TYPE I	10-17-24
	HW-910_19b	METAL BEAM RAIL (MODIFIED TYPE R-I) AND END ANCHORAGE TYPE II	10-17-24
	HW-910_19c	METAL BEAM RAIL (MODIFIED TYPE R-I) SYSTEMS 2 AND 3	11-08-22
✓	HW-910_20	MASH W-BEAM HARDWARE	10-17-24
	HW-910_21	METAL BEAM RAIL ( R-B MASH ) GUIDERAIL	01-05-24
	HW-910_22	METAL BEAM RAIL ( MD-B MASH) GUIDERAIL	11-08-22
	HW-910_23	METAL BEAM RAIL (R-B MASH) HALF & QUARTER POST SPACING GUIDERAIL	11-08-22
	HW-910_24	METAL BEAM RAIL SPAN SECTION TYPES II AND III	11-08-22

✓*	SHEET NO.	TITLE	APPROVAL DATE**
	HW-910_25a	METAL BEAM RAIL TRANSITION 350 TO MASH	10-17-24
	HW-910_25b	METAL BEAM RAIL MEDIAN APPLICATION TRANSITION 350 TO MASH GUIDERAIL	01-05-24
	HW-910_26	THRIE-BEAM ATTACHMENT HARDWARE	11-08-22
✓	HW-910_27	THRIE-BEAM ATTACHMENT	11-08-22
	HW-910_29	THRIE-BEAM BRIDGE ATTACHMENT TRAILING END	02-02-24
	HW-910_30a	METAL BEAM RAIL (6 X 6 BOX BEAM) GUIDERAIL - HARDWARE	01-28-25
	HW-910_30b	METAL BEAM RAIL (6 X 6 BOX BEAM) GUIDERAIL	01-28-25
✓	HW-911_01	R-B END ANCHORAGE TYPE I AND II	10-17-24
	HW-911_02	MD-B END ANCHORAGE TYPE I	10-17-24
	HW-911_03	ANCHOR IN EARTH CUT SLOPE & ANCHOR IN ROCK CUT SLOPE	01-05-24
	HW-911_06a	METAL BEAM RAIL (6 x 6 BOX BEAM) END ANCHORAGE TYPE I - HARDWARE	01-28-25
	HW-911_06b	METAL BEAM RAIL (6 x 6 BOX BEAM) END ANCHORAGE TYPE I	01-28-25
	HW-911_05	MERRITT PARKWAY GUIDERAIL END ANCHORS	11-08-22
✓	HW-913_01a	CHAIN LINK FENCE	11-08-22
✓	HW-913_01b	CHAIN LINK FENCE HARDWARE	11-08-22
	HW-913_02	CHAIN LINK FENCE GATES	11-08-22
	HW-918_01a	THREE CABLE GUIDERAIL (I-BEAM POSTS) SHEET 1	11-08-22
	HW-918_01b	THREE CABLE GUIDERAIL (I-BEAM POSTS) SHEET 2	11-08-22
	HW-918_01c	THREE CABLE GUIDERAIL (I-BEAM POSTS) SHEET 3	11-08-22
✓	HW-921_01	CONCRETE SIDEWALKS	11-08-22
✓	HW-922_01	BITUMINOUS CONCRETE SIDEWALK AND BITUMINOUS CONCRETE DRIVEWAY	11-08-22
✓	HW-924_01	CONCRETE DRIVEWAY RAMPS	10-17-24
	HW-930_01	OBJECT MARKER ( MAINTENANCE )	10-17-24
	HW-949_01a	LANDSCAPE PLANTING	11-09-22
	HW-949_01b	TREE STAKING	11-02-22
	HW-1800_01	GRADING PLAN FOR IMPACT ATTENUATION SYSTEMS (FLARED AND TANGENTIAL)	10-17-24
	HW-1800_02	GRADING PLAN FOR IMPACT ATTENUATION SYSTEMS (MEDIAN/GORE)	10-17-24





PIPE TRENCH  
FOR PIPES LESS THAN 48"



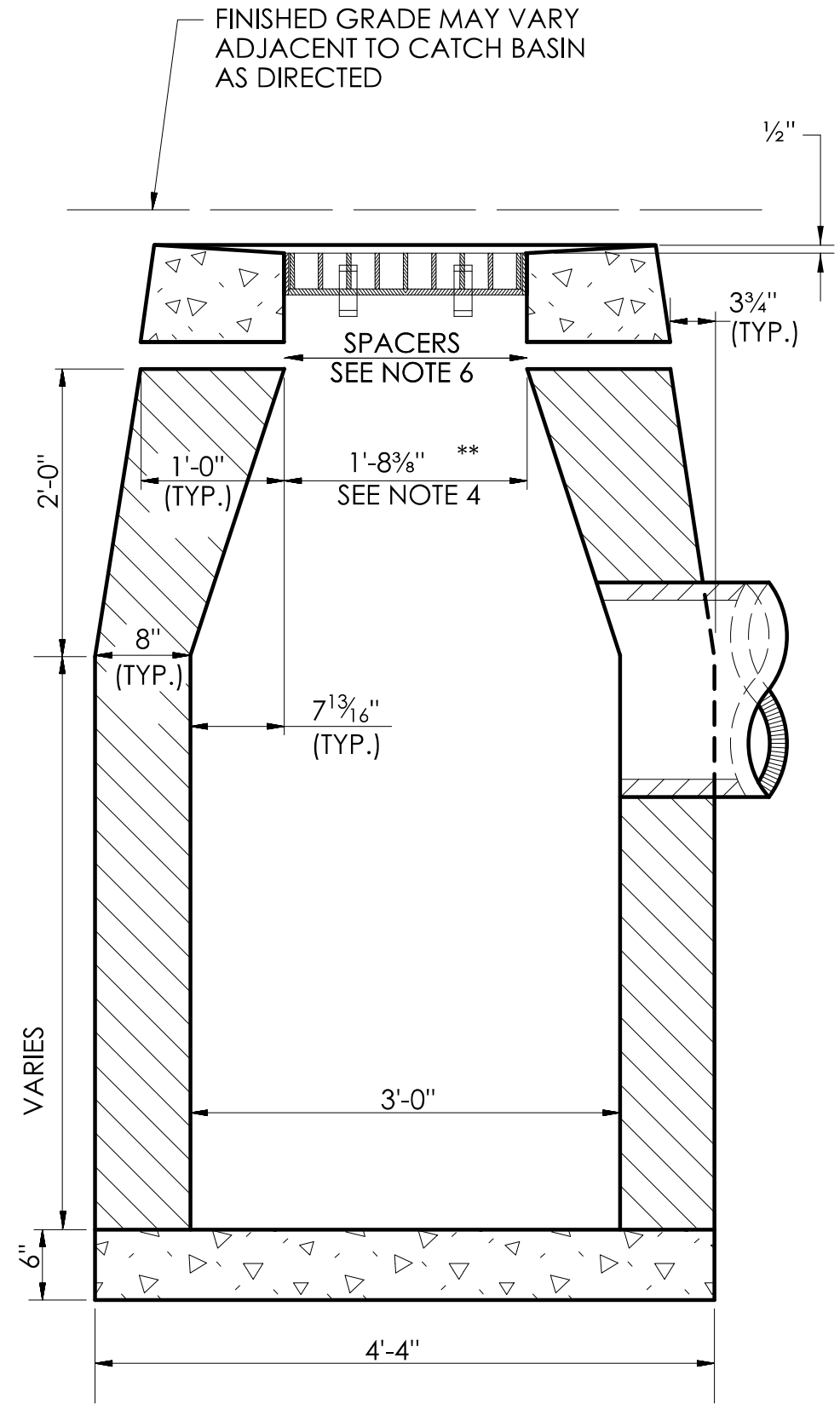
PIPE TRENCH  
FOR PIPES GREATER THAN  
OR EQUAL TO 48"

TRENCH WIDTH (TW) CHART

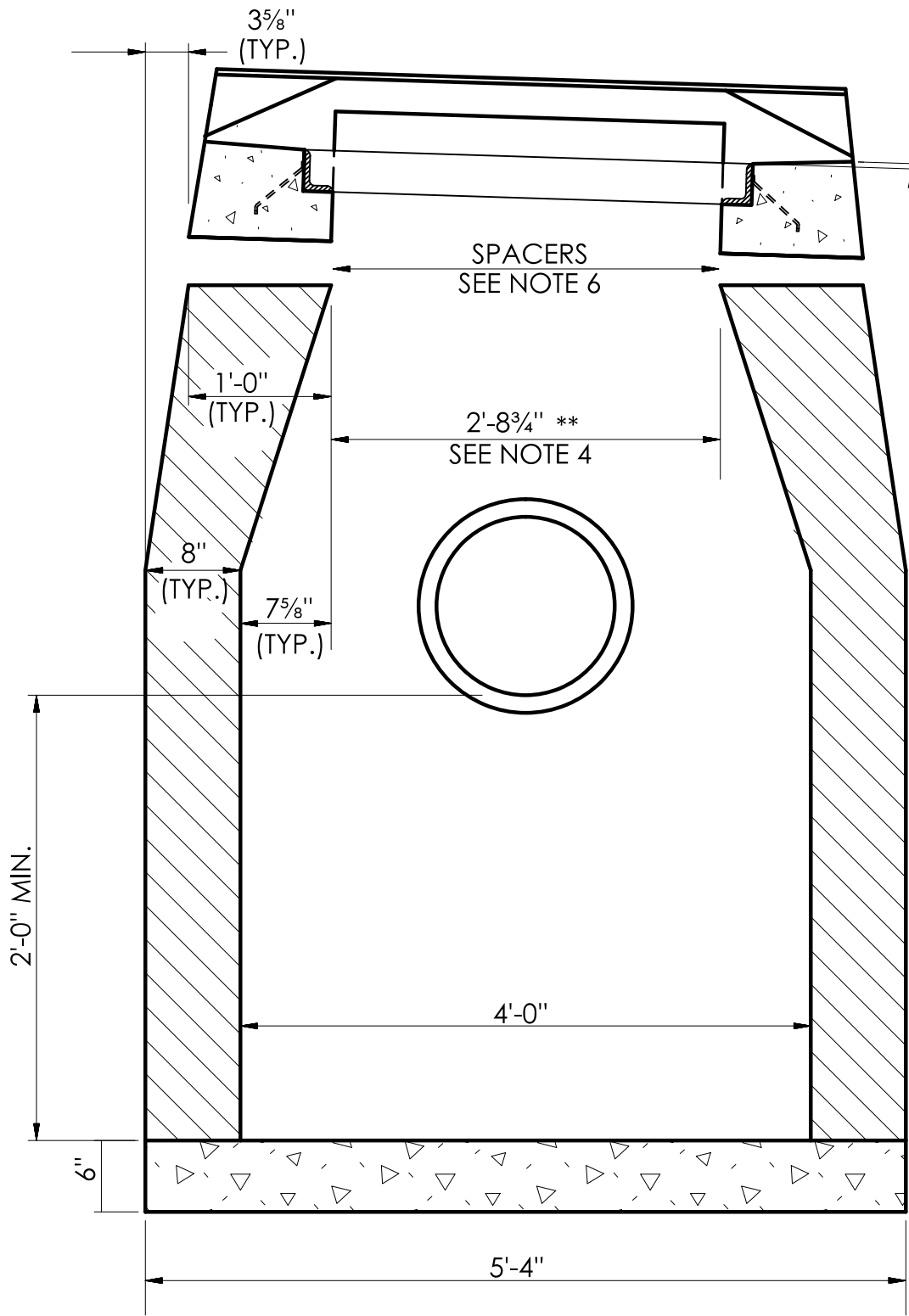
PIPE, PIPE-ARCH, OR DRAINAGE STRUCTURE	TRENCH WIDTH
PIPE OR PIPE-ARCH WITH NOMINAL INSIDE HORIZONTAL SPAN LESS THAN 30'	2' GREATER THAN NOMINAL INSIDE HORIZONTAL SPAN
PIPE OR PIPE-ARCH WITH NOMINAL INSIDE HORIZONTAL SPAN GREATER THAN OR EQUAL TO 30'	3' GREATER THAN NOMINAL INSIDE HORIZONTAL SPAN
PIPE OR PIPE-ARCH FABRICATED FROM STRUCTURAL PLATES	4' GREATER THAN NOMINAL INSIDE HORIZONTAL SPAN
DRAINAGE STRUCTURES	2' BEYOND ALL EXTERIOR OR FOUNDATION WALLS

GENERAL NOTES:

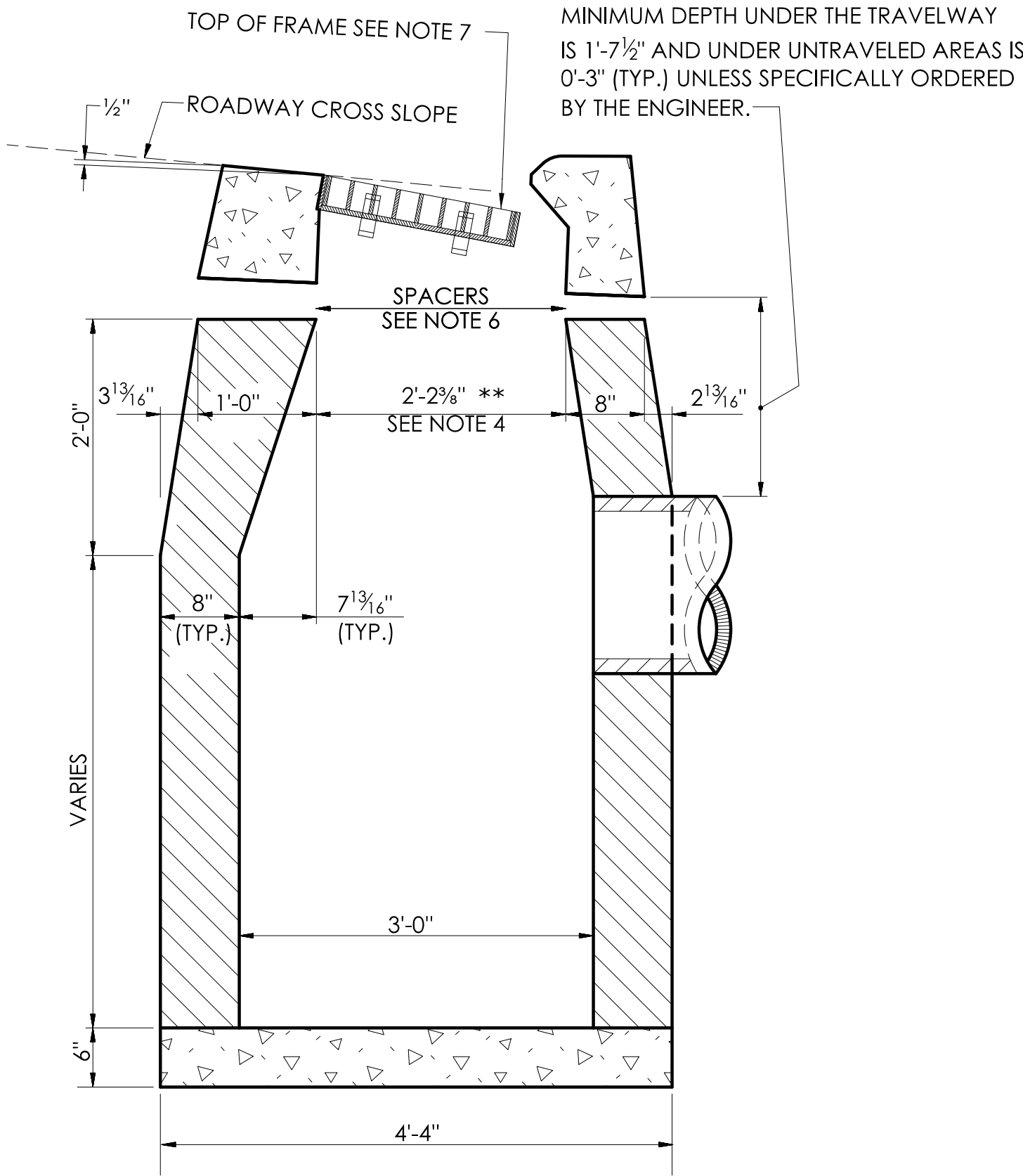
- 1. FOR CATCH BASIN TOPS, SEE SHEET NO. HW-586\_07.
- 2. ALL FACES OF STRUCTURES IN CONTACT WITH CONCRETE PAVEMENT SHALL BE COVERED WITH A LAYER OF TAR PAPER OR APPROVED EQUAL.
- 3. USE 6'-0" ON UPGRADE SIDE (SEE PLAN VIEW) OF CONTINUOUS GRADE AND 1'-0" ON DOWNGRADE SIDE OF CONTINUOUS GRADE OR AS DIRECTED BY THE ENGINEER.
- 4. IF MASONRY UNITS ARE REQUIRED, THE BASIN SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE DIMENSIONS SHOWN. CORBELLING SHALL BE PERMITTED TO A MAXIMUM OF 3". NO PROJECTION SHALL EXTEND INSIDE THE LIMITS FOR THE CATCH BASIN OPENINGS SHOWN IN THE SECTION VIEWS \*\*.
- 5. WALL THICKNESS OF ALL CATCH BASINS OVER 10' DEEP SHALL BE INCREASED TO 12" THICK. INSIDE DIMENSION SHALL REMAIN THE SAME. 12" THICKNESS SHALL START AFTER THE FIRST 10'.
- 6. FOR GRADE ADJUSTMENT OF THE CATCH BASIN TOP ( TO MATCH THE ROADWAYS' PROFILE AND CROSS-SLOPE SHOWN ON THE PLANS) USE SPACERS EITHER CONCRETE MASONRY UNIT OR PRECAST WITH THE REQUIRED REINFORCING ( RECOMMENDED BY THE MANUFACTURER) COMBINED WITH MORTAR AS NEEDED TO PROVIDE THE PROPER GRADE ADJUSTMENTS.
- 7. TOP OF FRAME ELEVATION SHALL BE MEASURED IN THE CENTER OF GRATE AT GUTTER LINE.



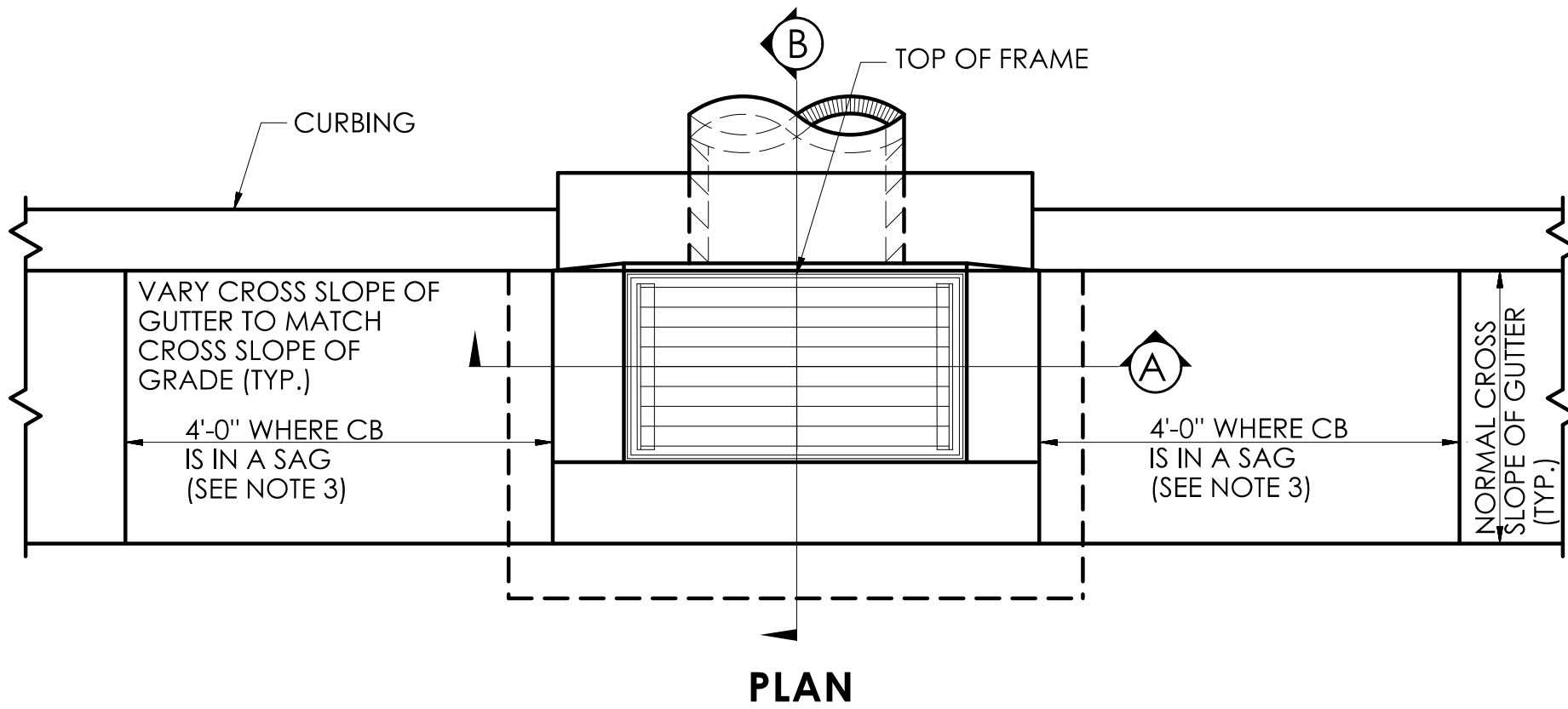
SECTION B  
TYPE "C-L" CATCH BASIN



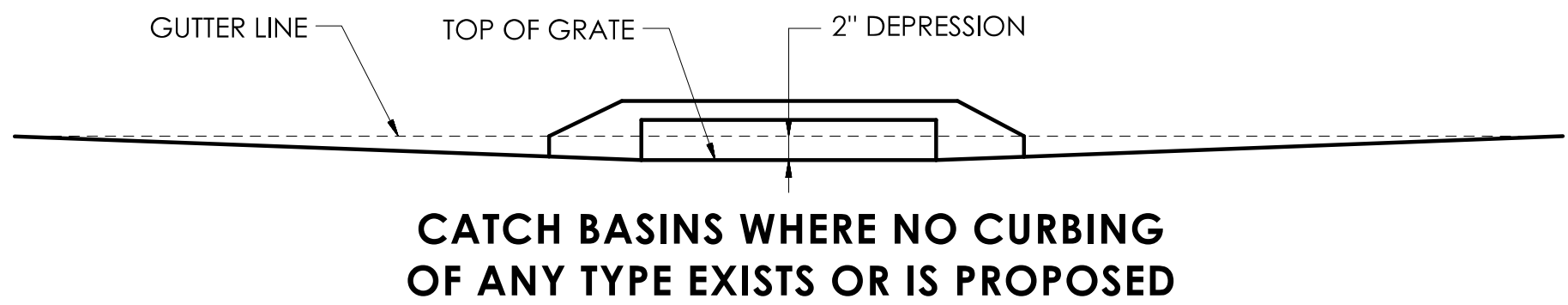
SECTION A  
TYPE "C" & "C-L" CATCH BASIN  
(TYPE "C" TOP SHOWN)



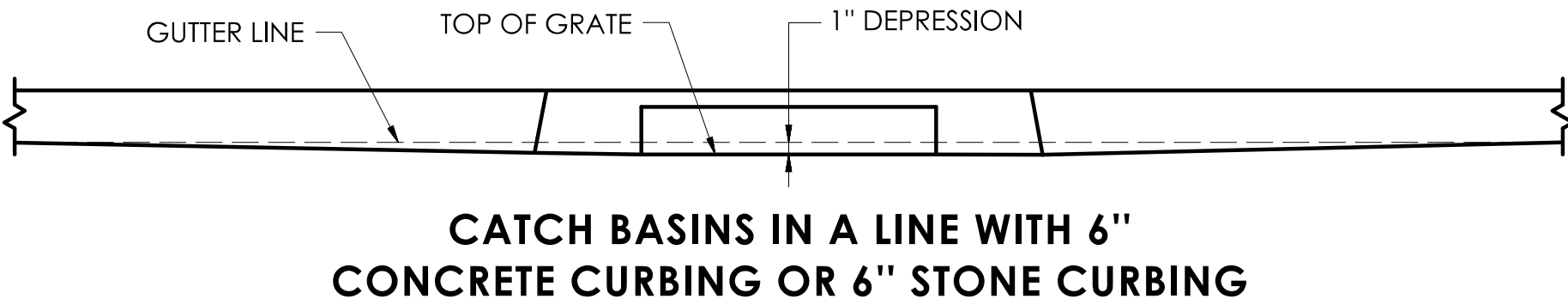
SECTION B  
TYPE "C" CATCH BASIN



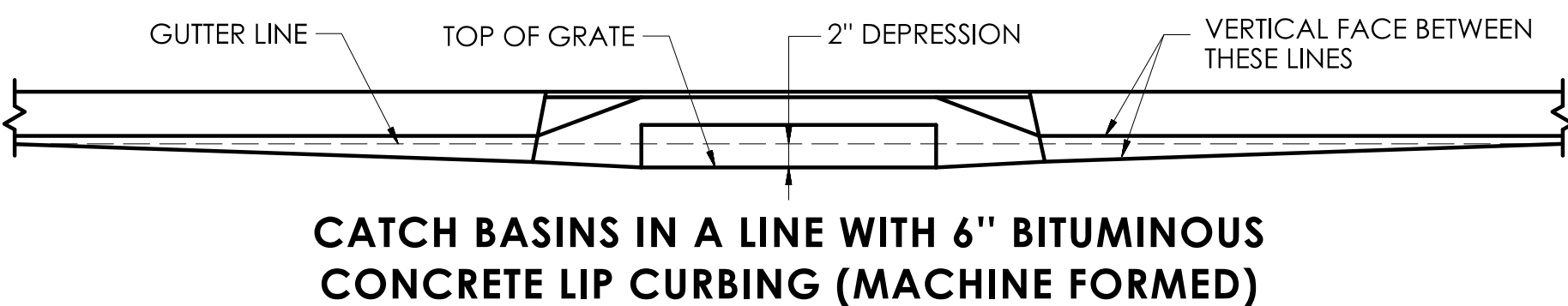
CATCH BASINS IN A LINE WITH 4" CONCRETE PARK CURBING OR 4" BITUMINOUS CONCRETE PARK CURBING



CATCH BASINS WHERE NO CURBING OF ANY TYPE EXISTS OR IS PROPOSED

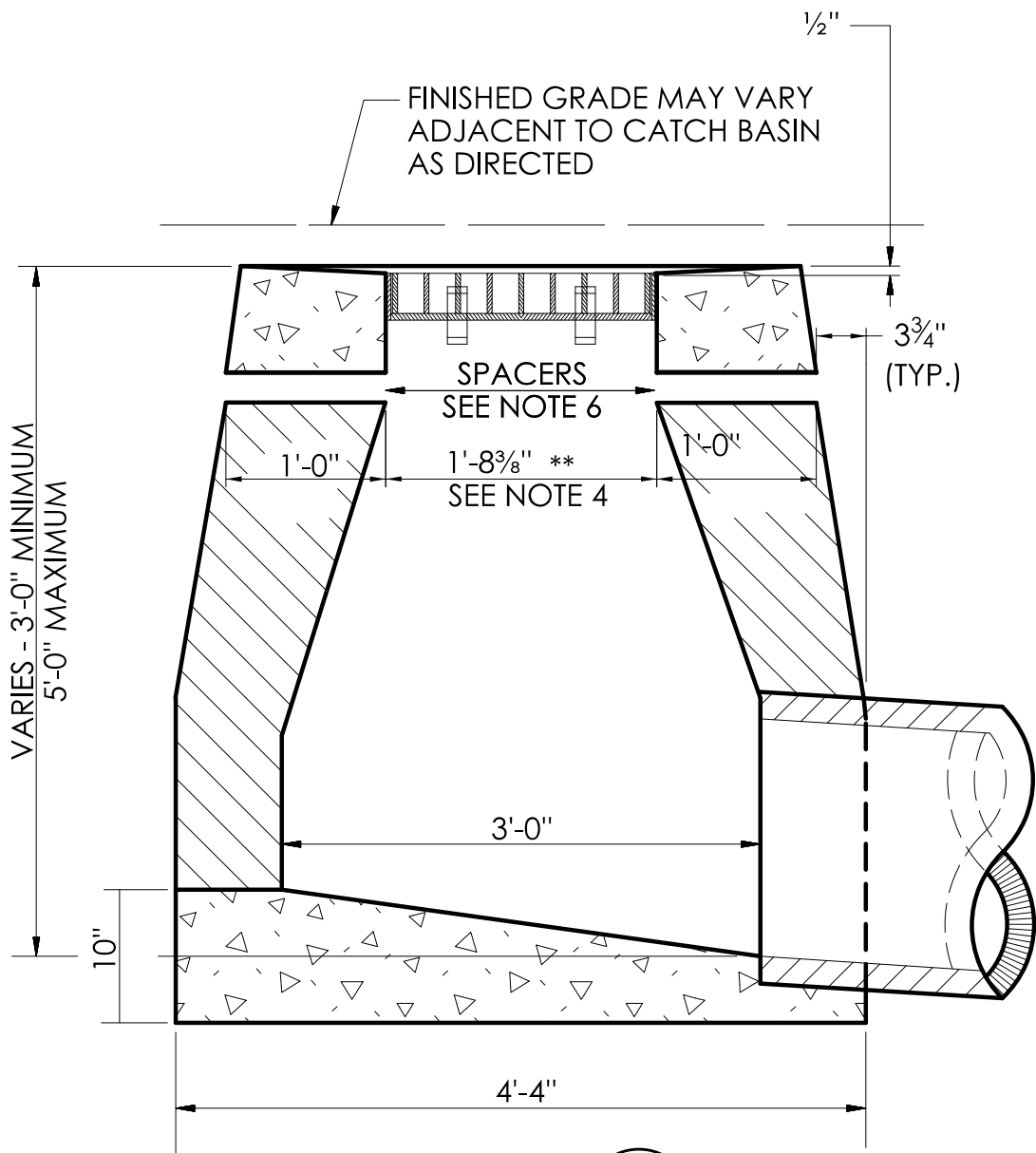


CATCH BASINS IN A LINE WITH 6" CONCRETE CURBING OR 6" STONE CURBING

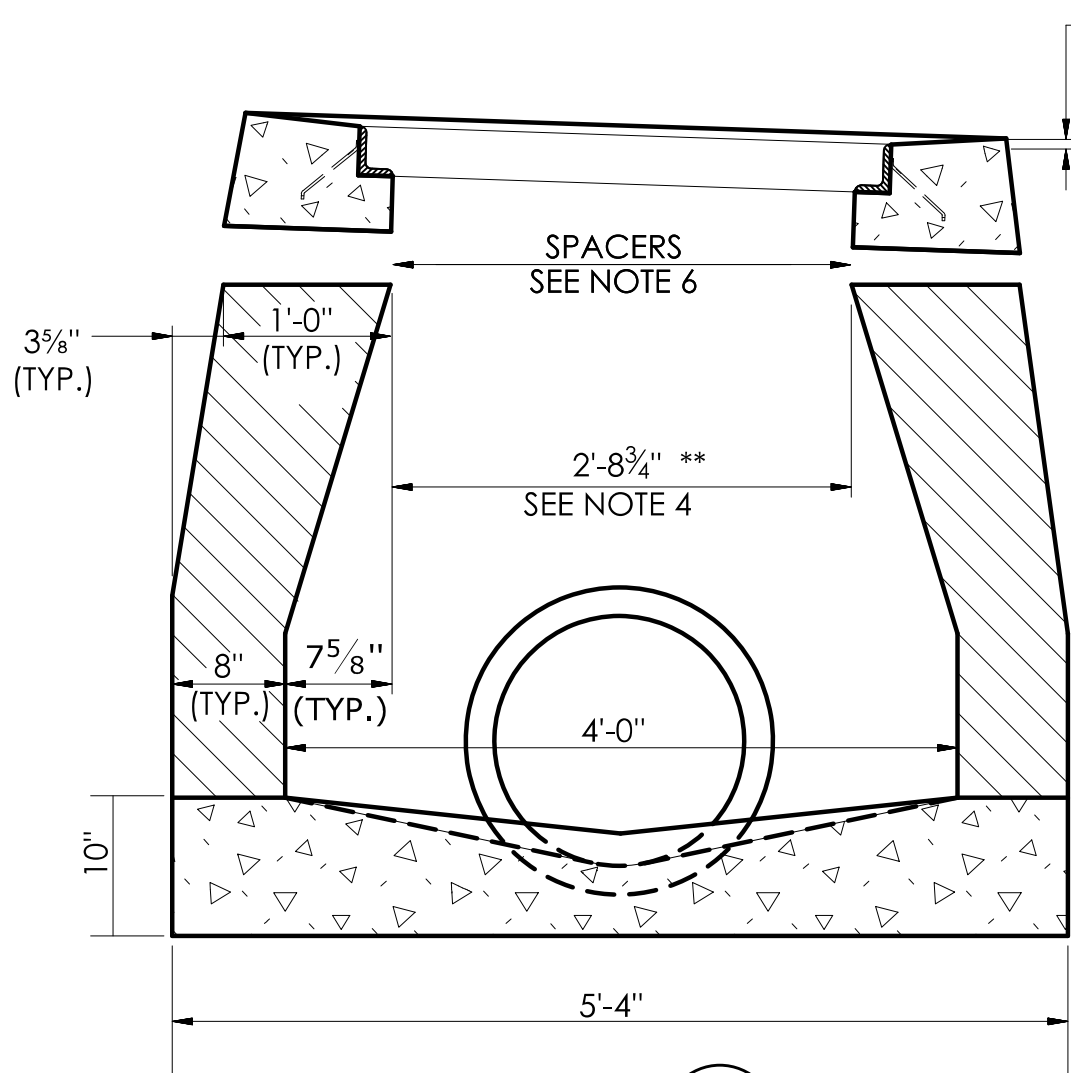


CATCH BASINS IN A LINE WITH 6" BITUMINOUS CONCRETE LIP CURBING (MACHINE FORMED)

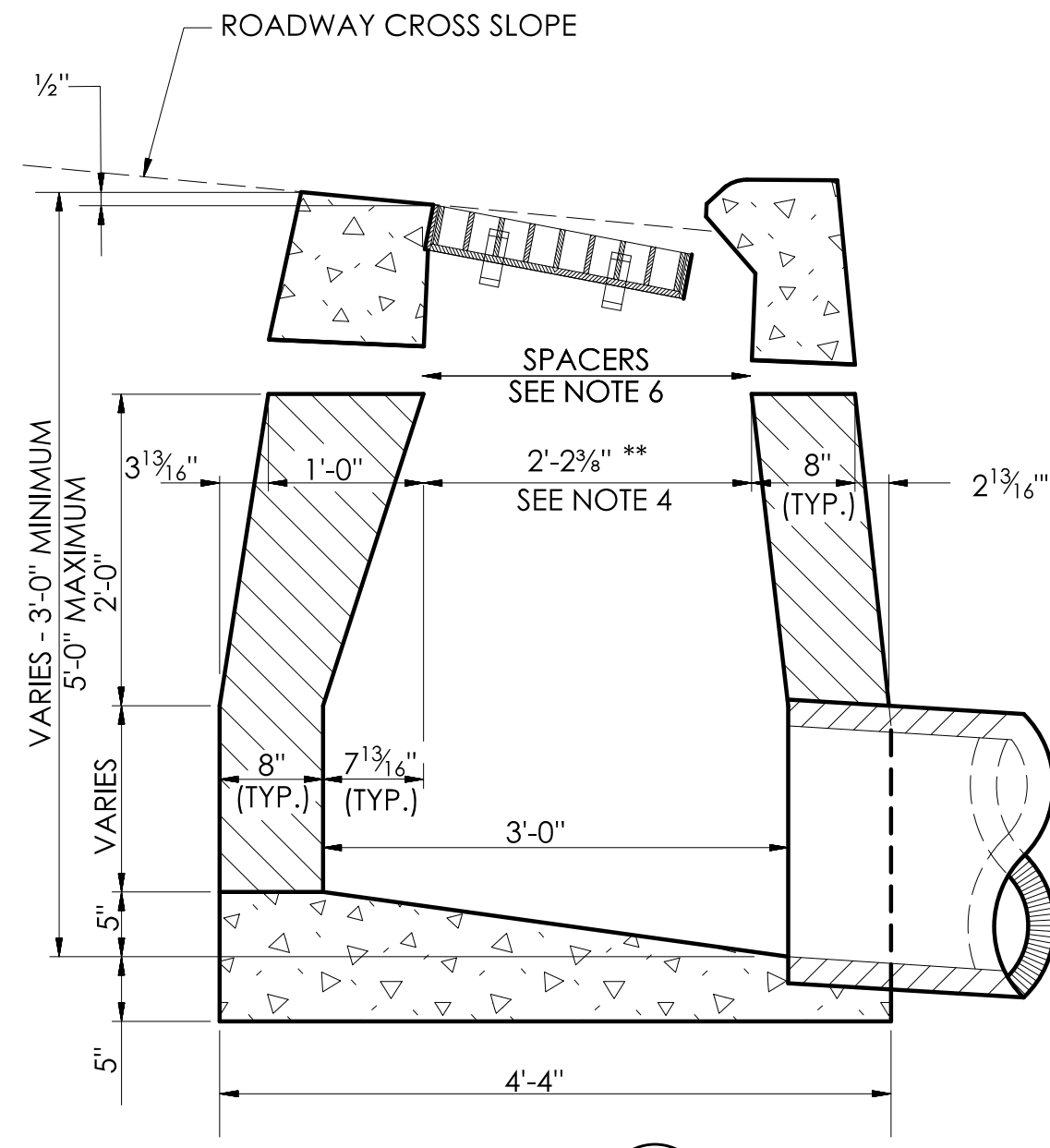
DETAILS OF DEPRESSED GUTTER STRIP FOR TYPE "C" CATCH BASIN



SECTION B  
TYPE "C-L" DROP INLET



SECTION A  
TYPE "C" & "C-L" DROP INLET  
(TYPE "C-L" TOP SHOWN)



SECTION B  
TYPE "C" DROP INLET

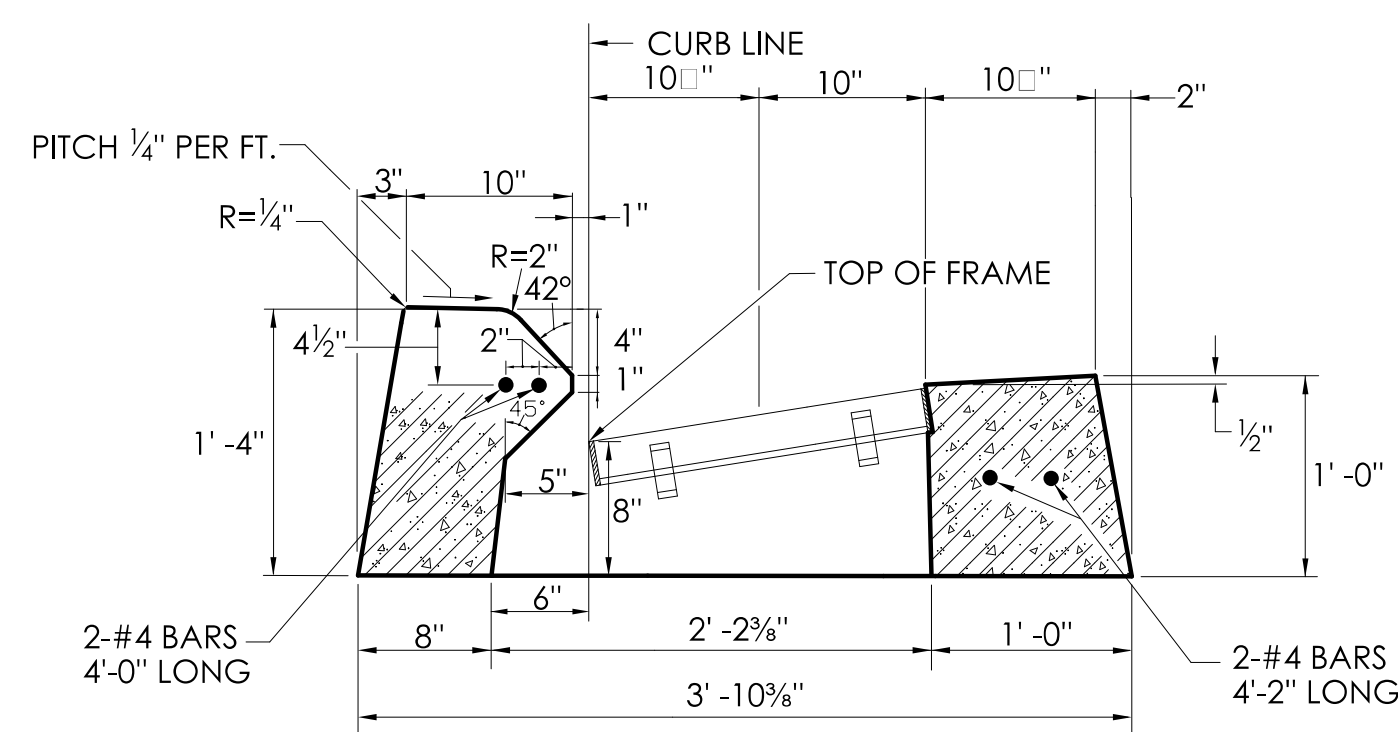


1. SEE SHEET HW-586\_08, FOR CATCH BASIN FRAMES AND GRATES  
AND HW-586\_09 FOR CATCH BASIN LOCK DOWN TOPS.
2. SEE SHEET HW-586\_01, CATCH BASIN AND DROP INLET TYPES "C" AND "C-L"  
TO DETERMINE THE TOP OF FRAME DEPRESSION AT THE GUTTER.
3. ALL BARS SHALL HAVE A MINIMUM 2" COVER.
4. Manufacturing Dimensional Tolerance Table

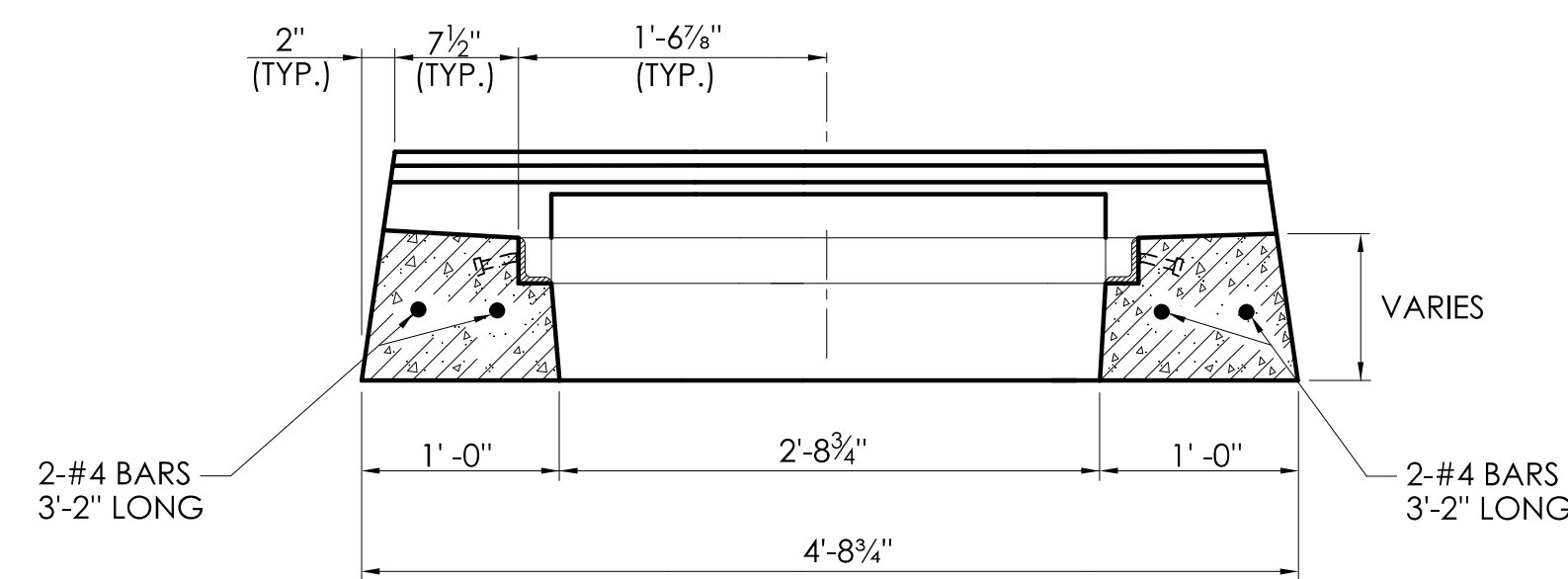
A 3D perspective drawing of a rectangular tray. The tray has a flat base and raised sides. The base is covered with a grid of small squares, resembling a woven mat or a printed pattern. The drawing is done in a simple line-art style with black outlines on a white background.

[illegible]

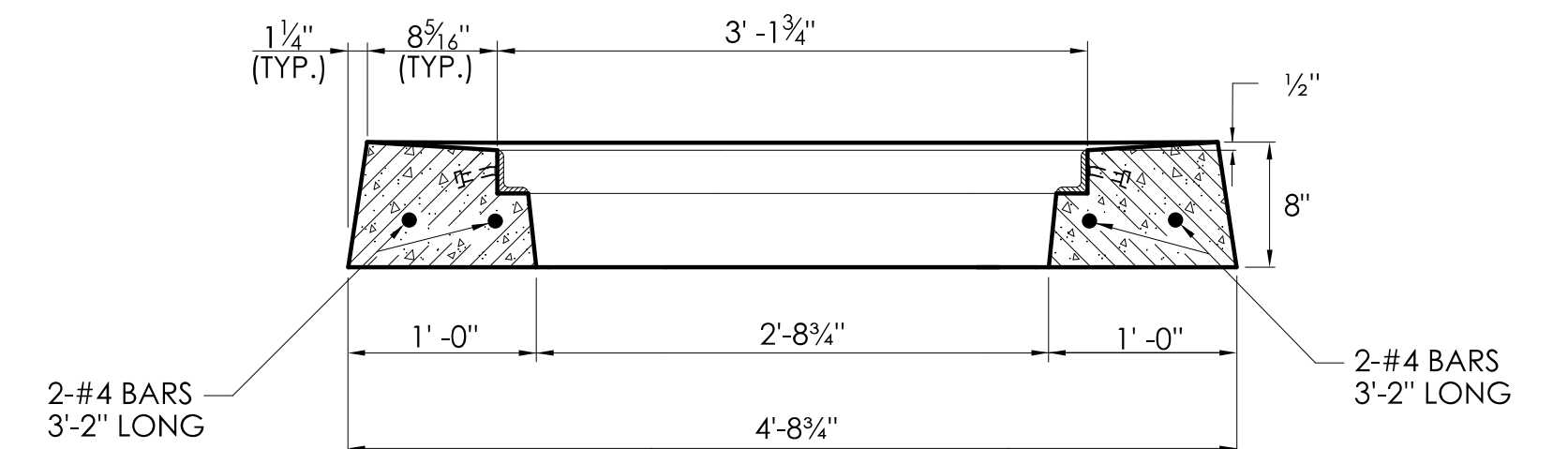
**SECTION B**



**SECTION B**

[illegible]

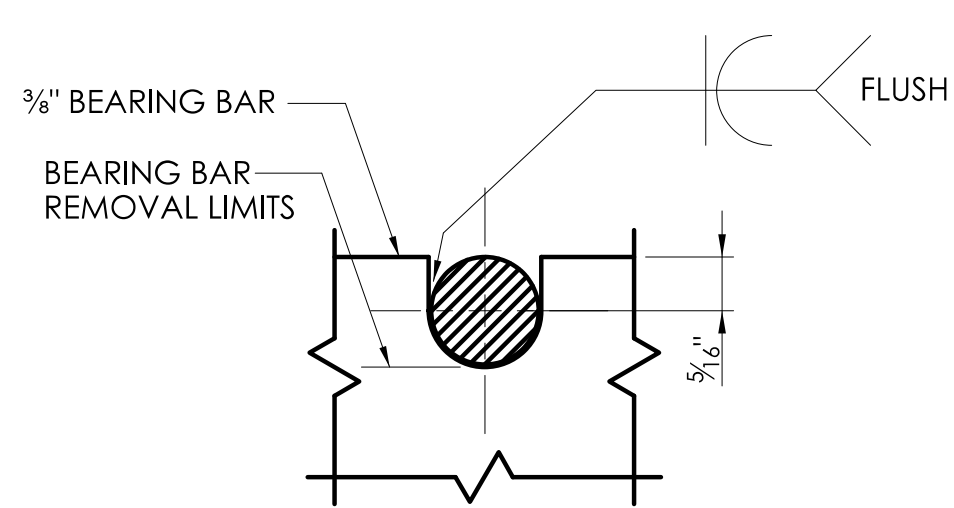
**SECTION B**

[illegible]

TYPE "C-L" CATCH BASIN TOP  
SECTION D

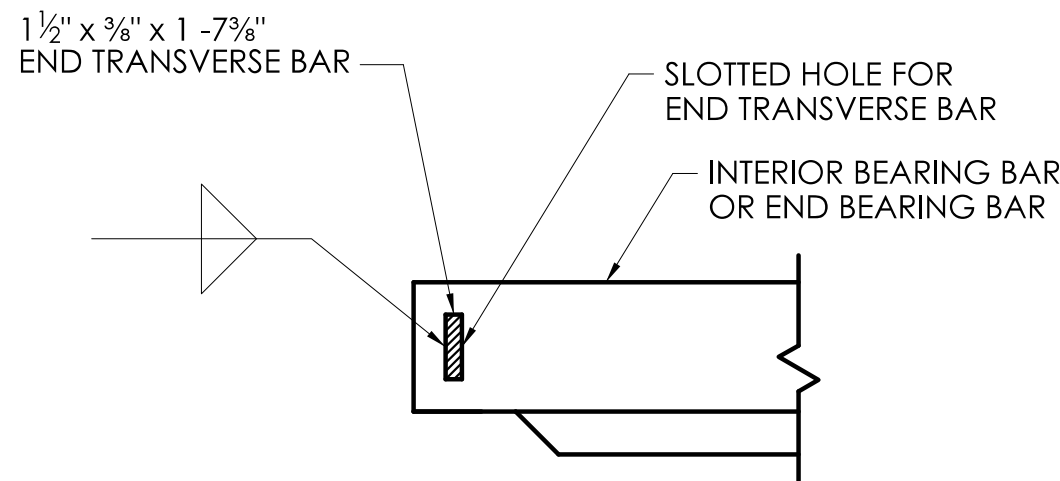
STANDARD SHEET NO.:  
**HW-586 07a**

PLOTTED DATE: 10/22/2024

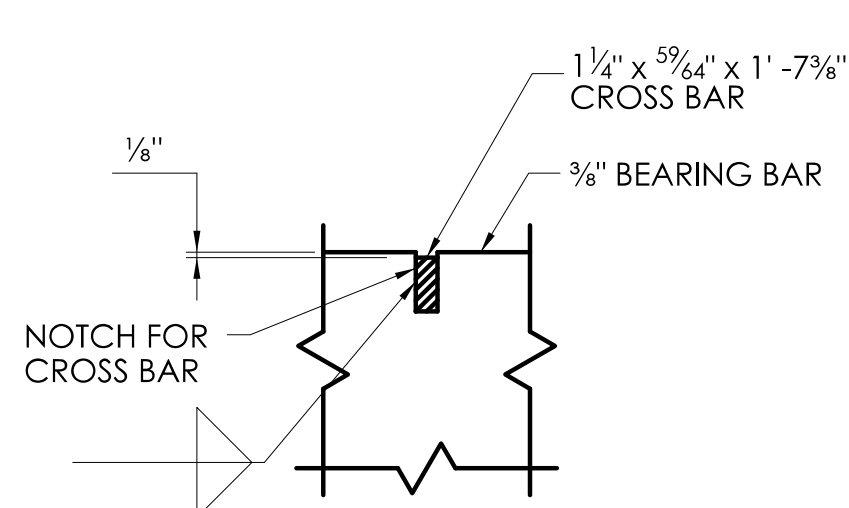


NOTE:  
3/8" DIA. ROUND BAR SHALL CONTACT BEARING BAR AT BOTTOM AND BE FLUSH AT TOP.

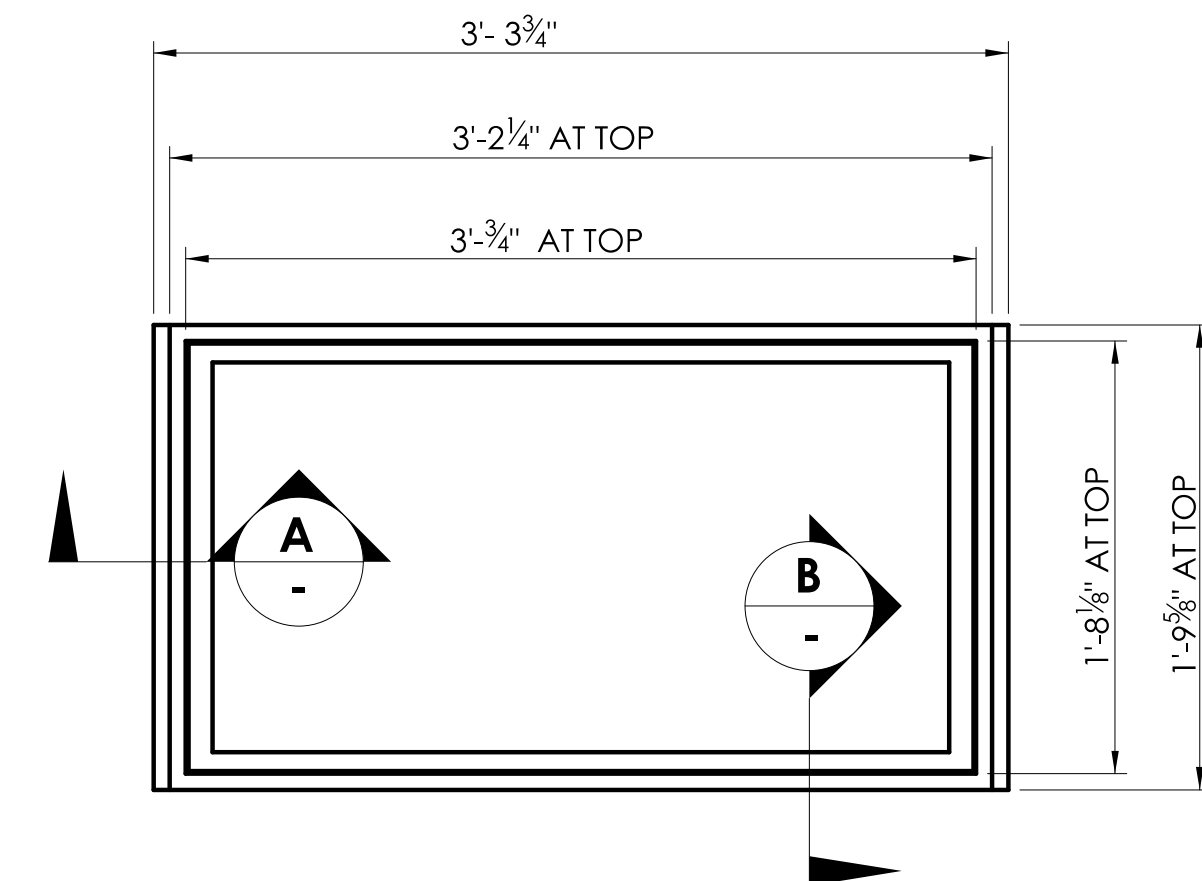
**ROUND BAR ATTACHMENT  
CATCH BASIN GRATE TYPE A**



**END TRANSVERSE BAR ATTACHMENT  
CATCH BASIN GRATE TYPE A AND B**



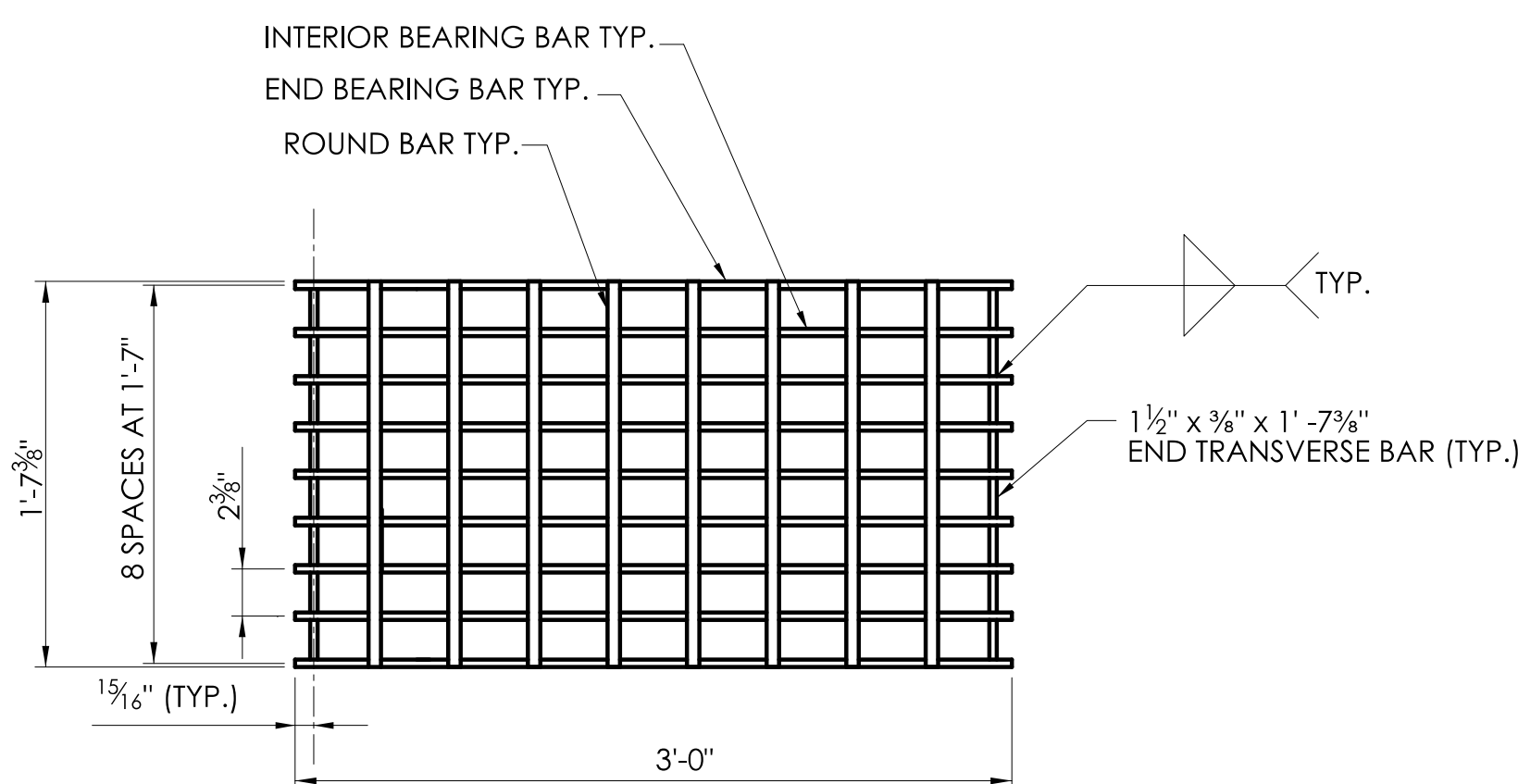
**CROSS BAR ATTACHMENT  
CATCH BASIN GRATE TYPE B**



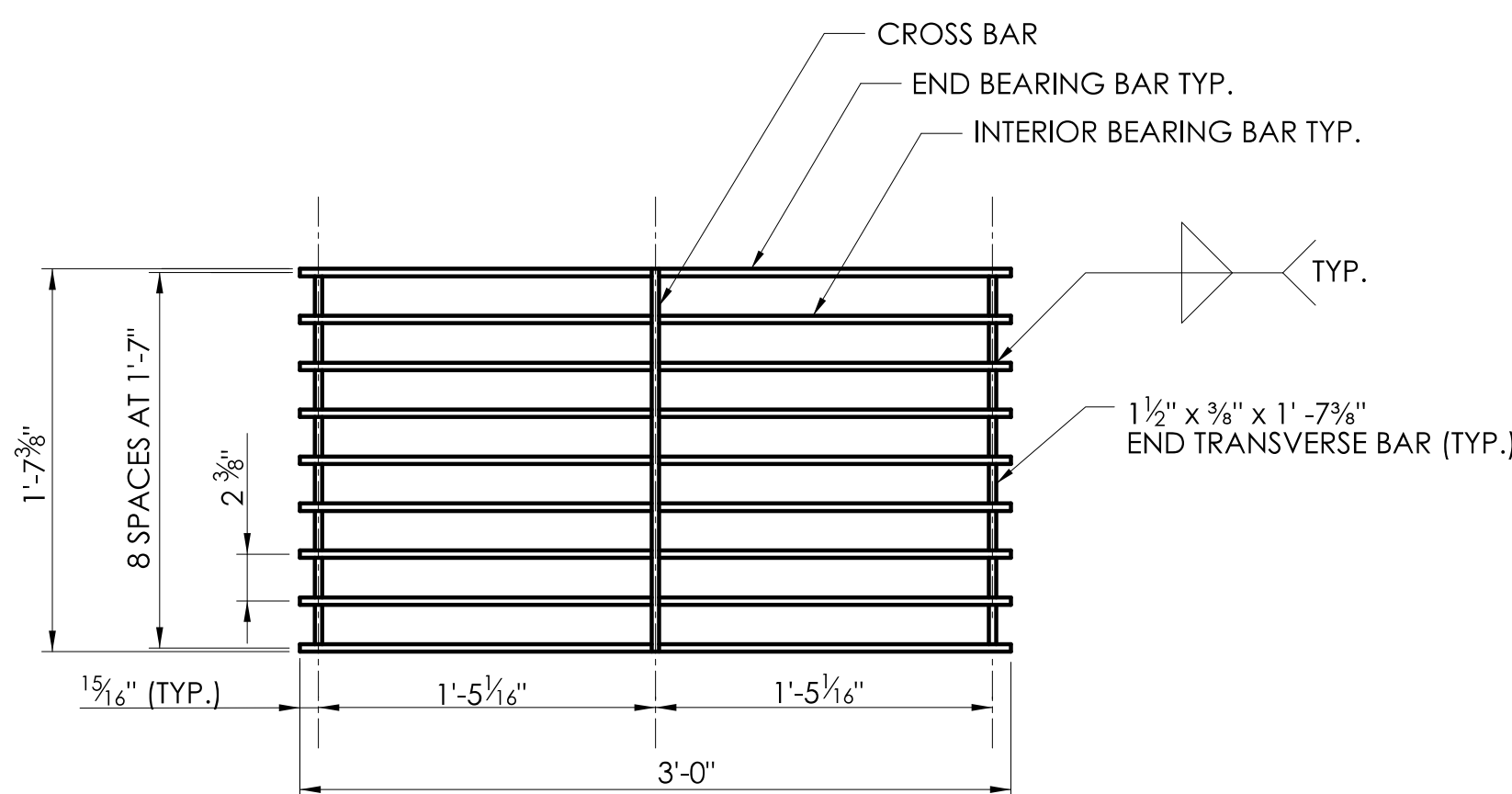
**PLAN**

**GENERAL NOTES:**

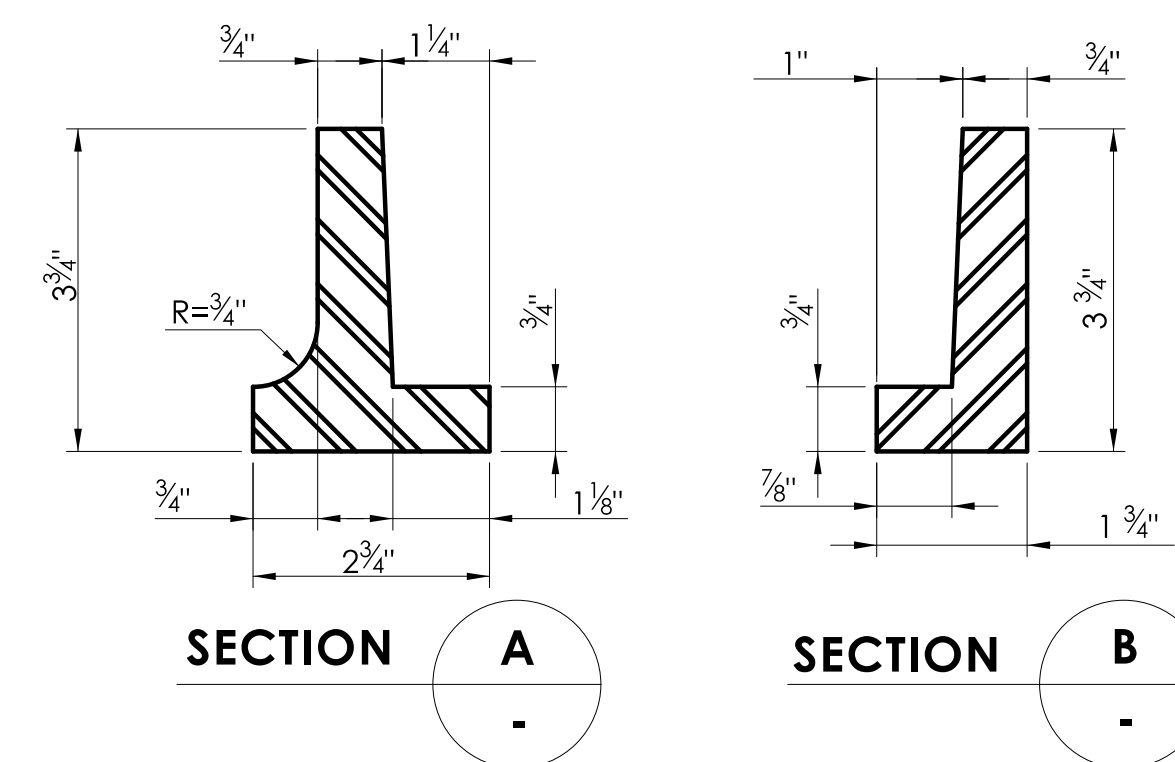
1. STEEL OR CAST IRON SHALL BE USED FOR FRAMES. STEEL SHALL BE USED FOR TYPE "A" AND "B" GRATES.
2. TYPE "A" GRATES SHALL BE USED ON ALL ROADWAYS WHERE BICYCLE TRAFFIC IS ALLOWED OR ON HEAVY DUTY LOCK DOWN TOPS AS DIRECTED BY THE ENGINEER.
3. TYPE "B" GRATES SHALL BE USED ON ALL LIMITED ACCESS HIGHWAYS, RAMP AND WHERE BICYCLE TRAFFIC IS NOT ALLOWED OR AS DIRECTED BY THE ENGINEER.
4. DO NOT GALVANIZE CAST IRON FRAMES.
5. DIMENSIONAL TOLERANCES SHALL BE  $\pm 3/16$ ".
6. ALL STEEL BARS SHALL BE WELDED AT ALL INTERSECTIONS.



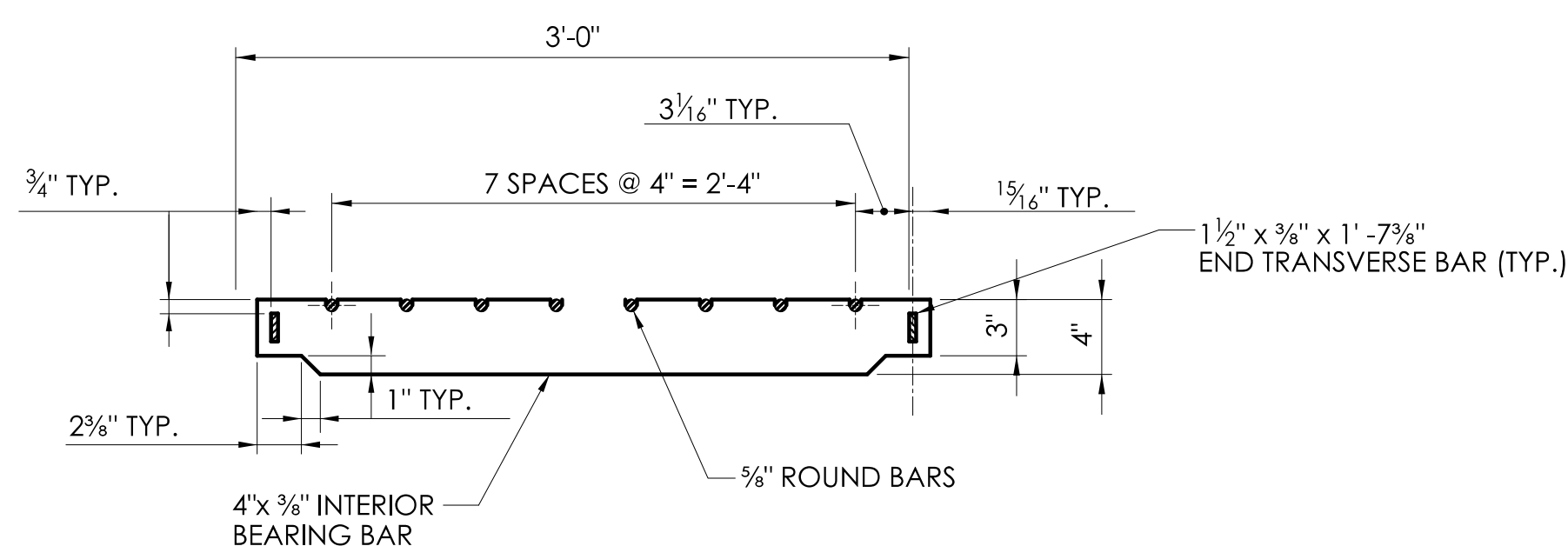
**PLAN**



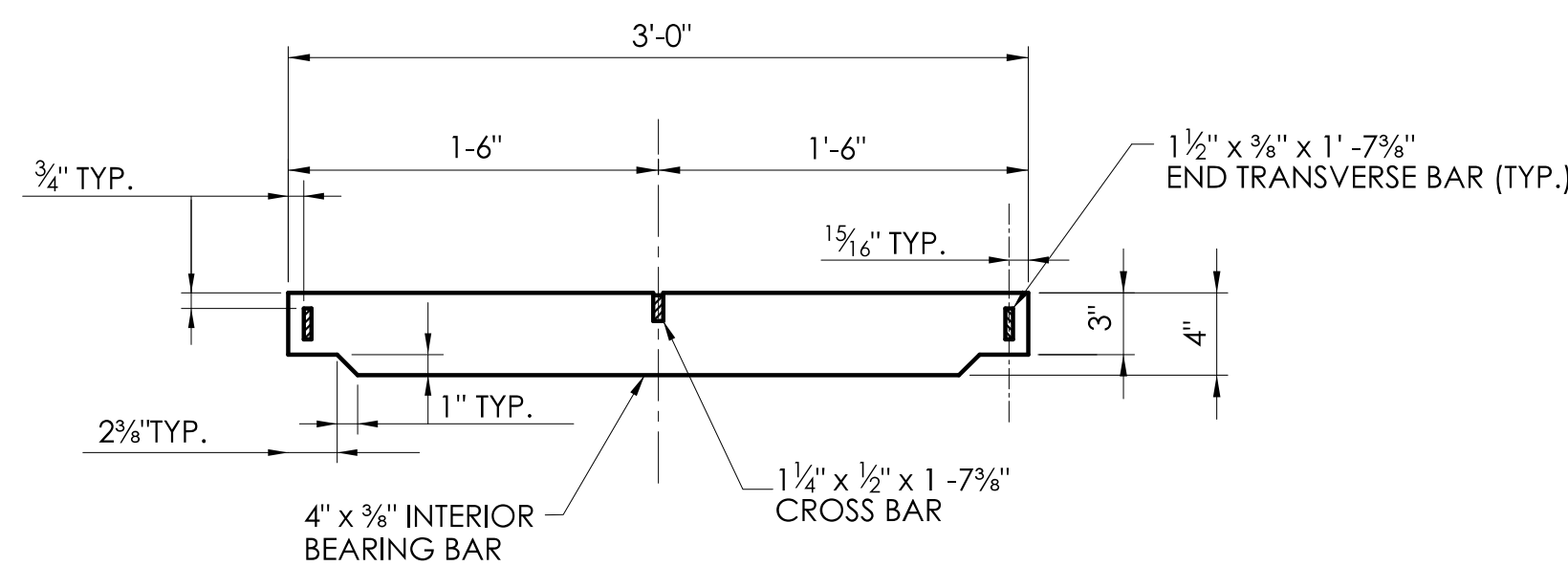
**PLAN**



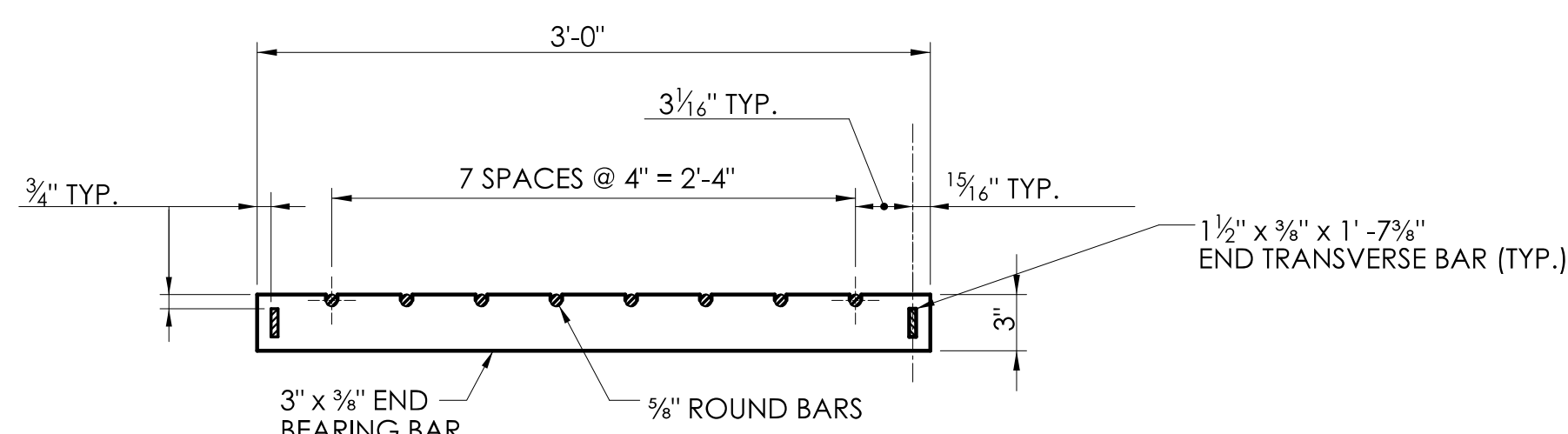
**CAST IRON FRAME ALTERNATE**



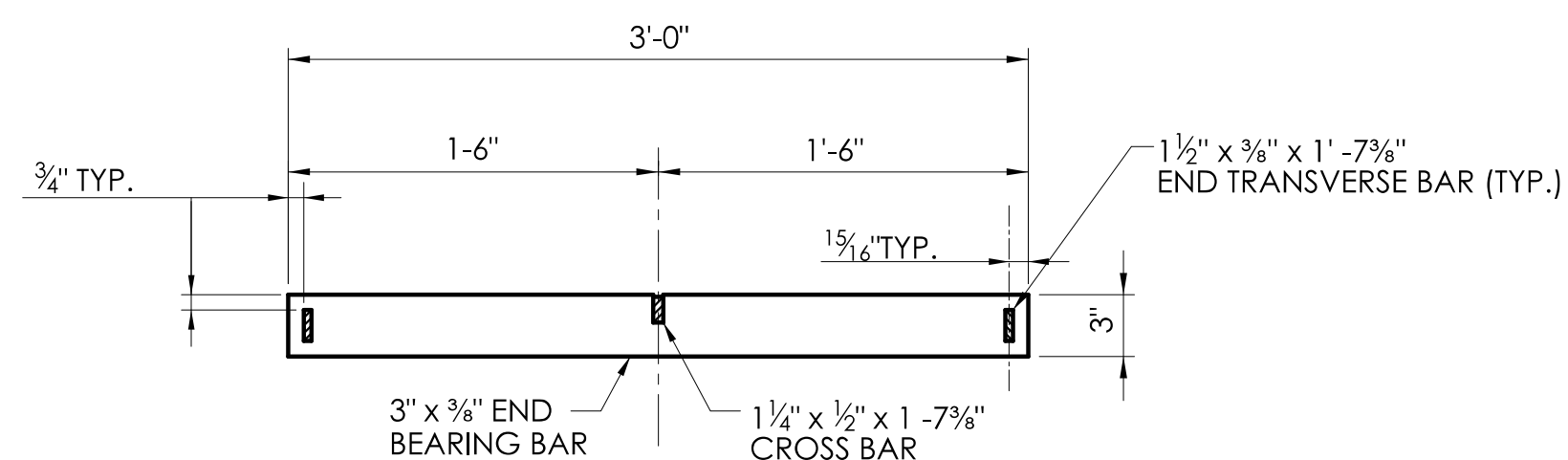
**ELEVATION- INTERIOR BEARING BAR**



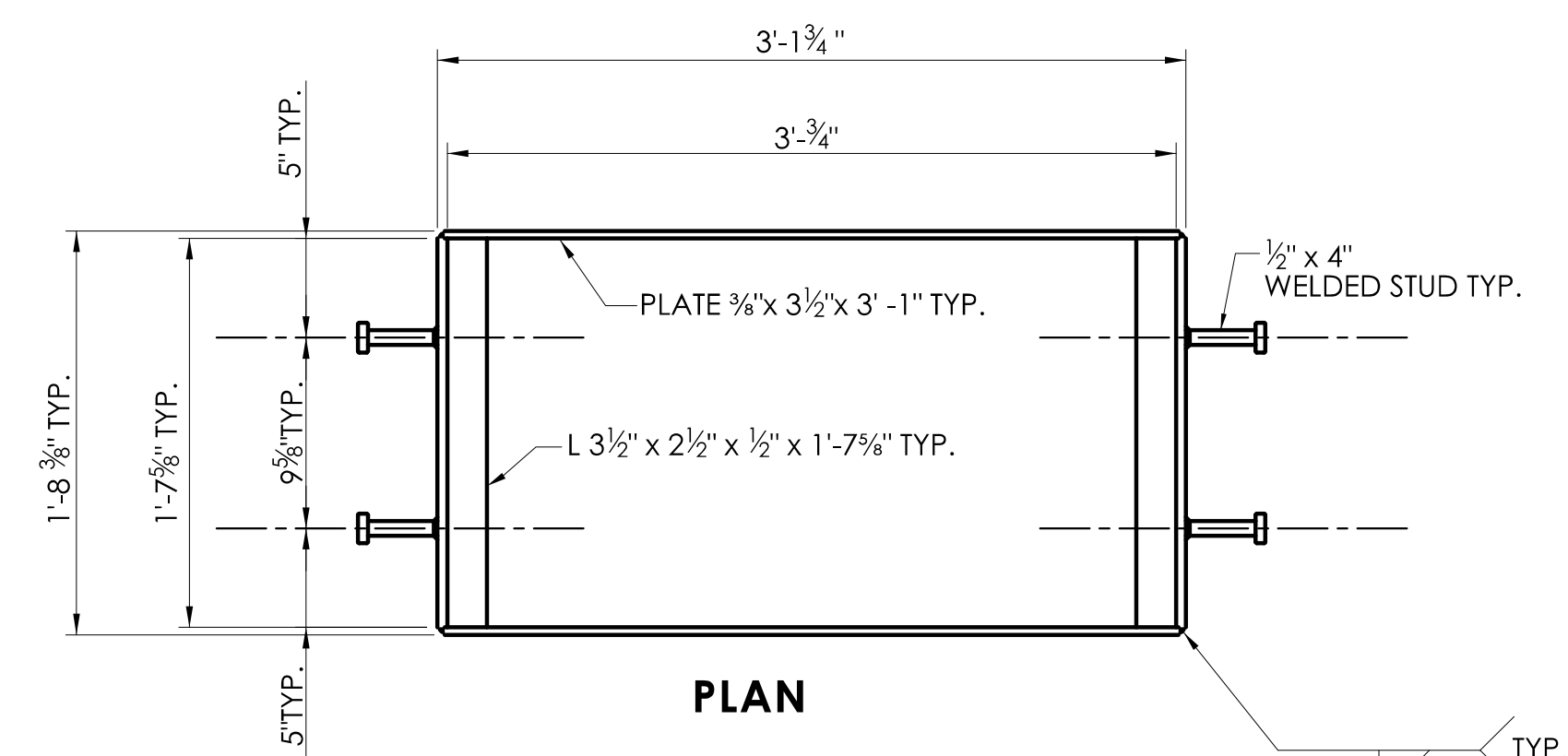
**ELEVATION- INTERIOR BEARING BAR**



**ELEVATION- END BEARING BAR  
CATCH BASIN GRATE TYPE A**



**ELEVATION- END BEARING BAR  
CATCH BASIN GRATE TYPE B**

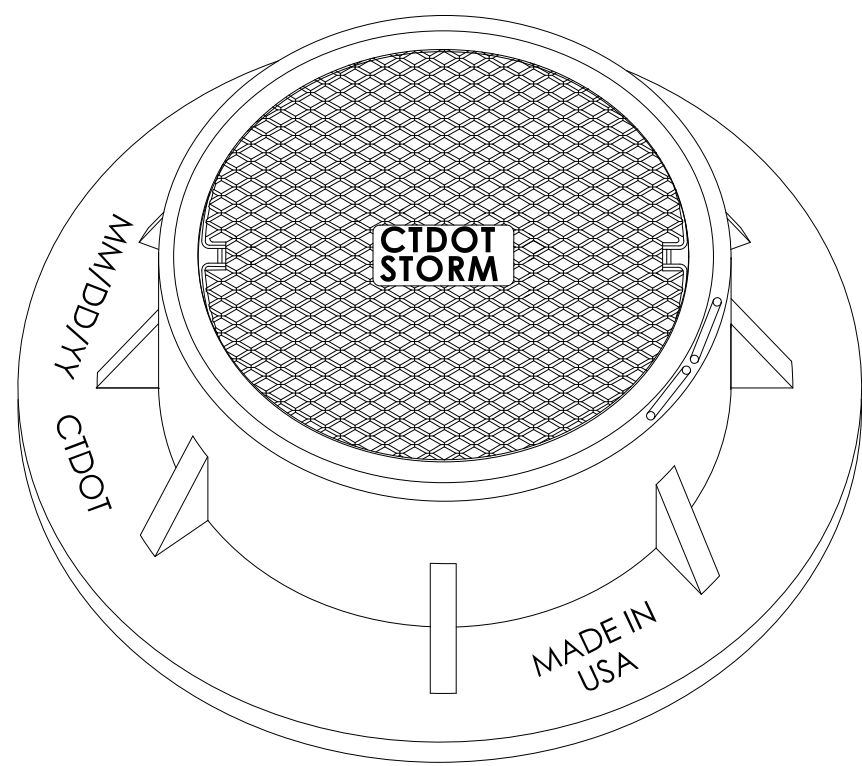


**WELDED STUD ANCHOR DETAILS  
STEEL FRAME**

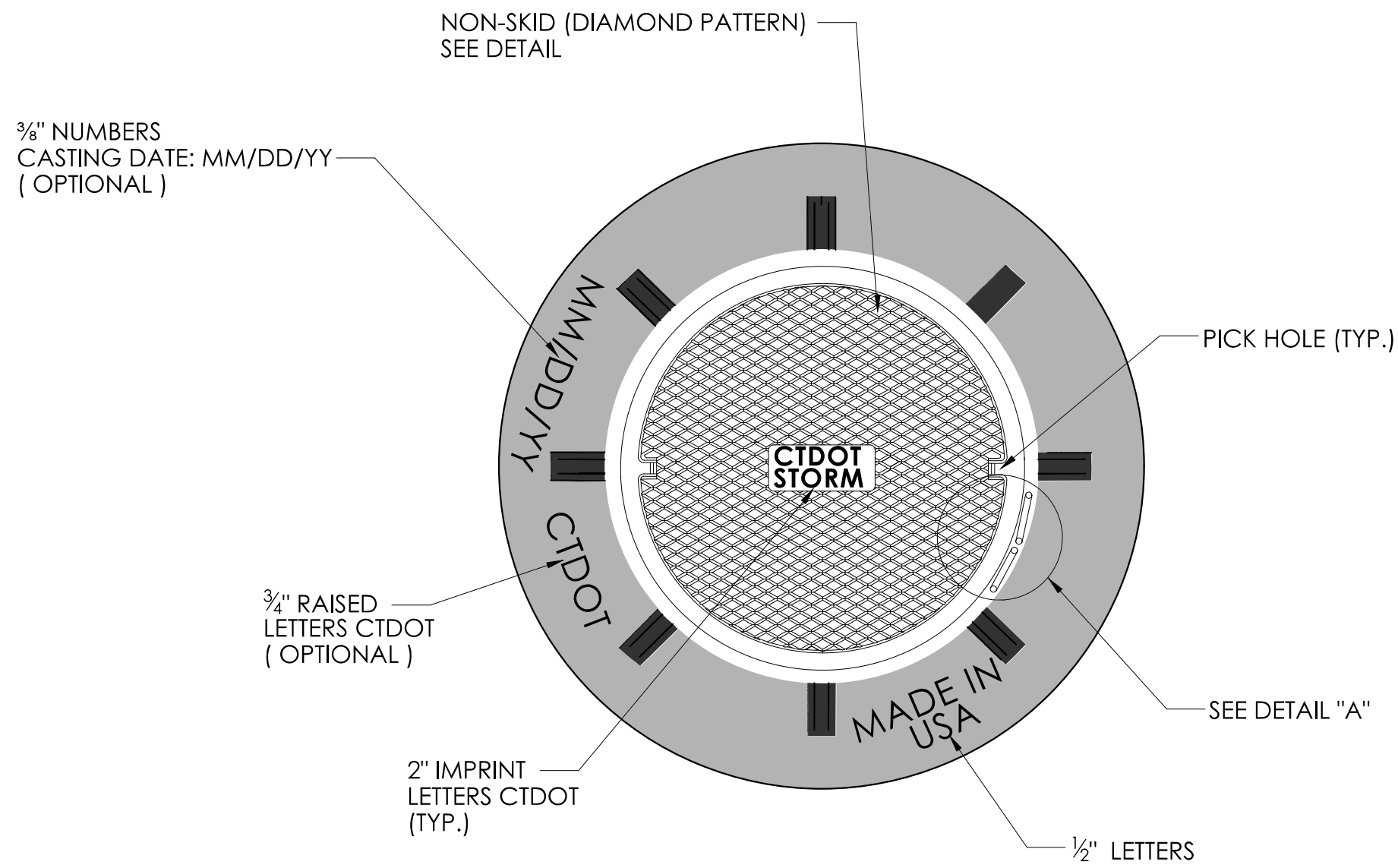


GENERAL NOTES:

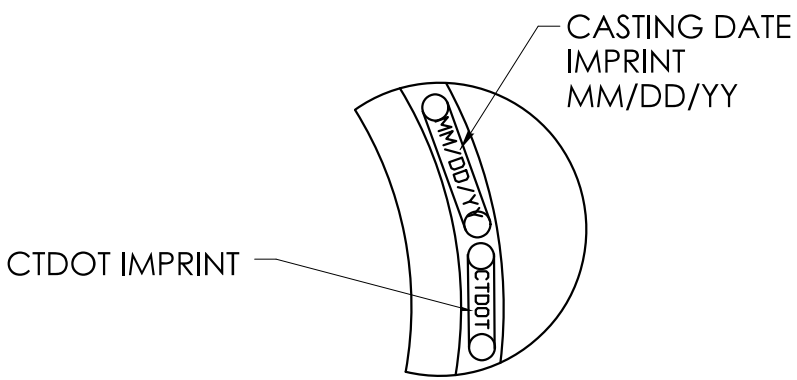
1. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
2. CASTING DATE SHALL BE INDICATED ON EACH; FRAME ( SEE DETAIL A) AND COVER (PLACED ON UNDERSIDE).



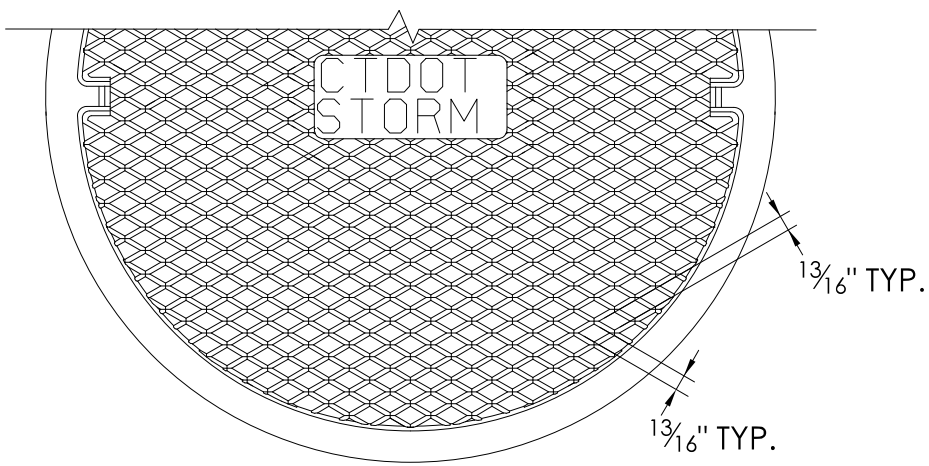
MANHOLE FRAME AND COVER



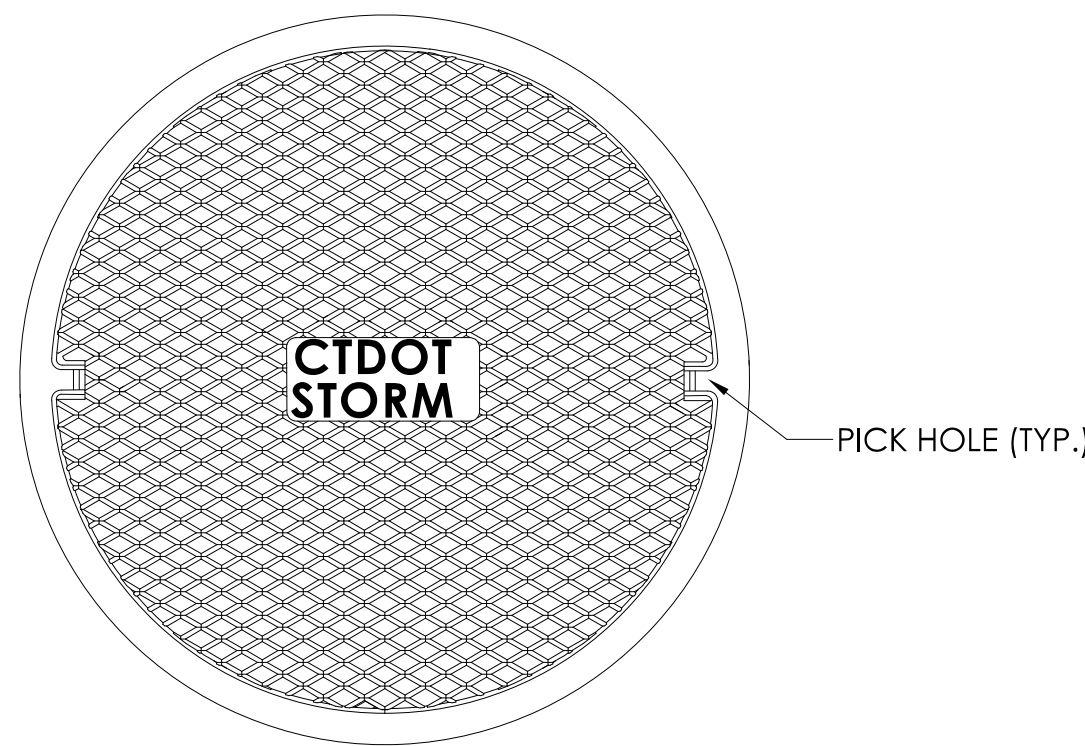
PLAN



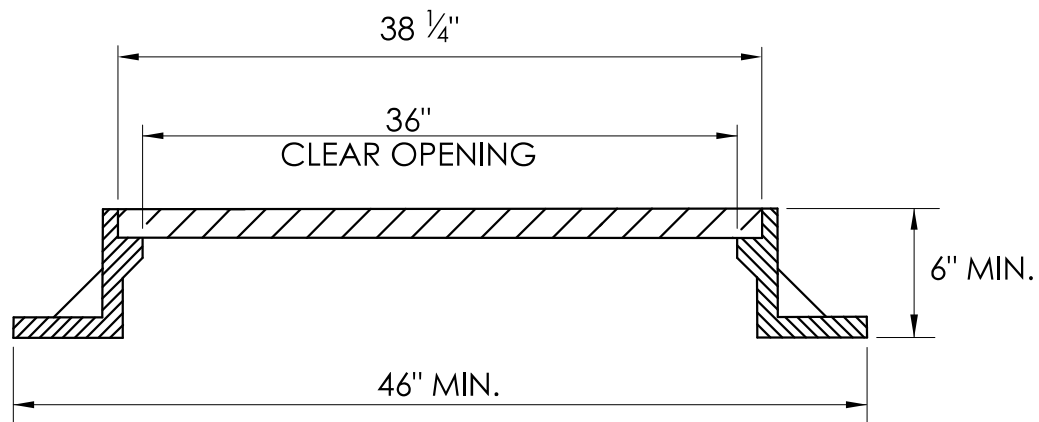
DETAIL "A"



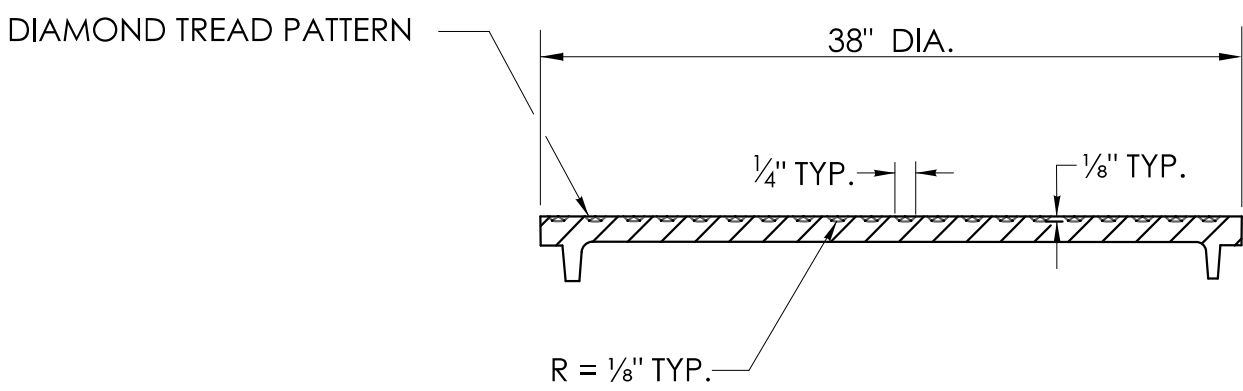
DIAMOND PATTERN PLAN



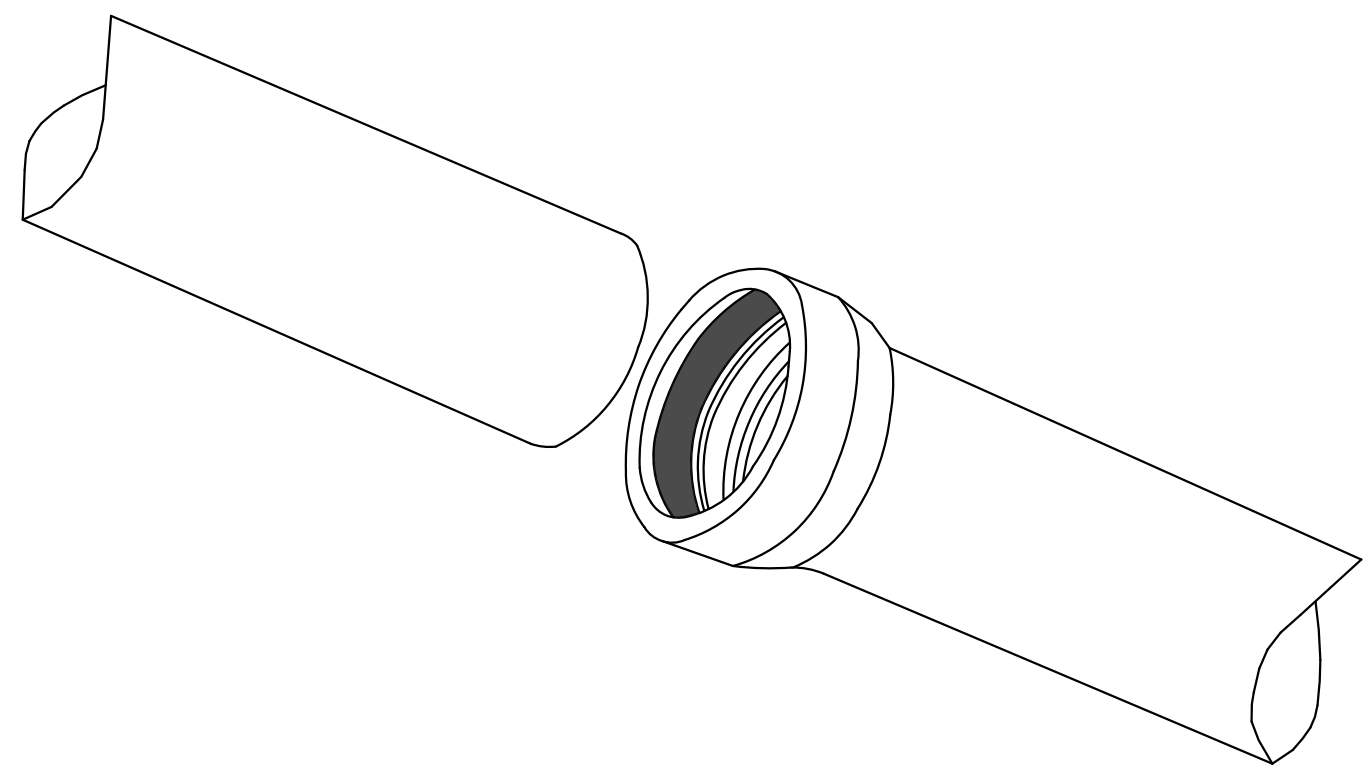
MANHOLE COVER PLAN



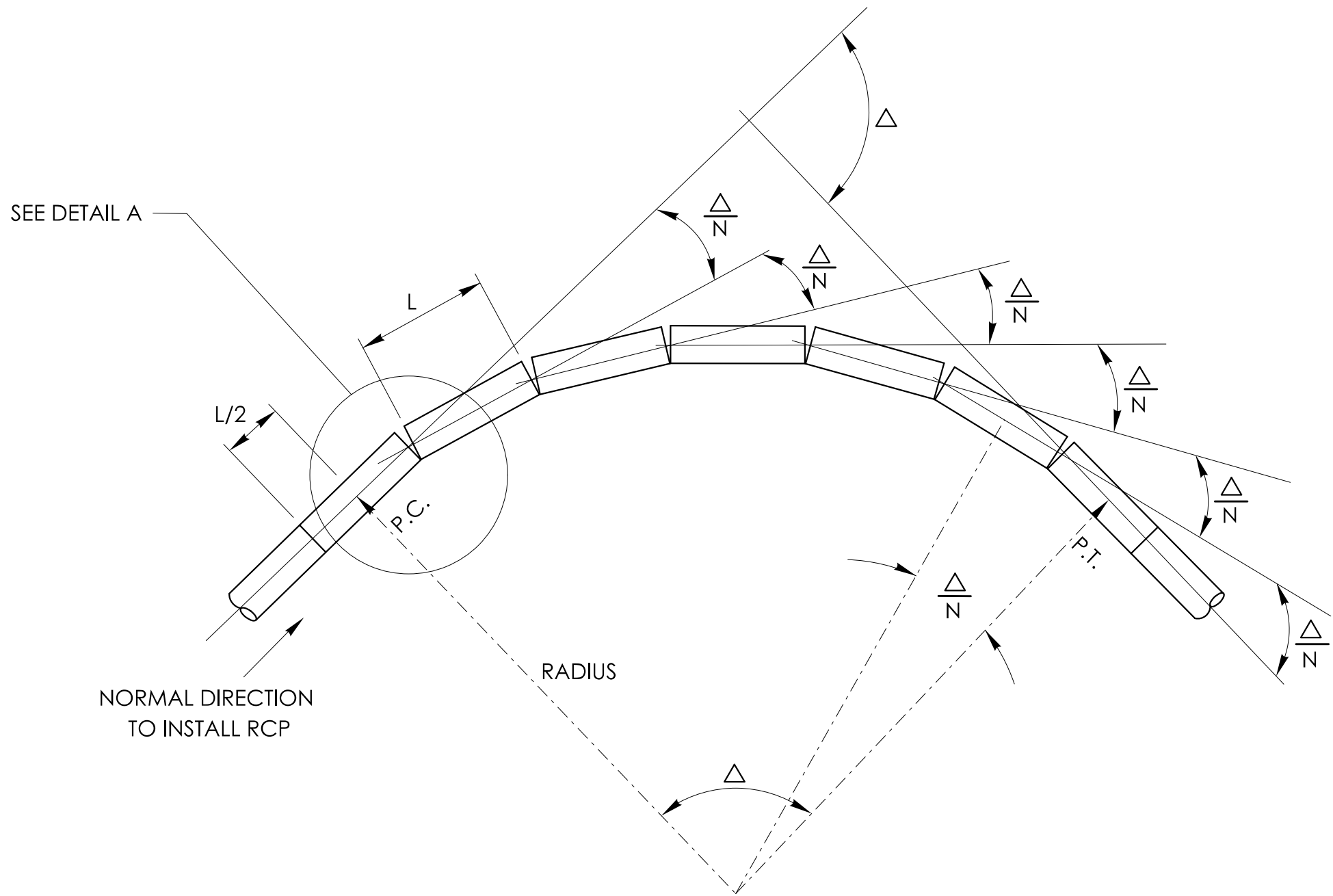
MANHOLE FRAME AND COVER



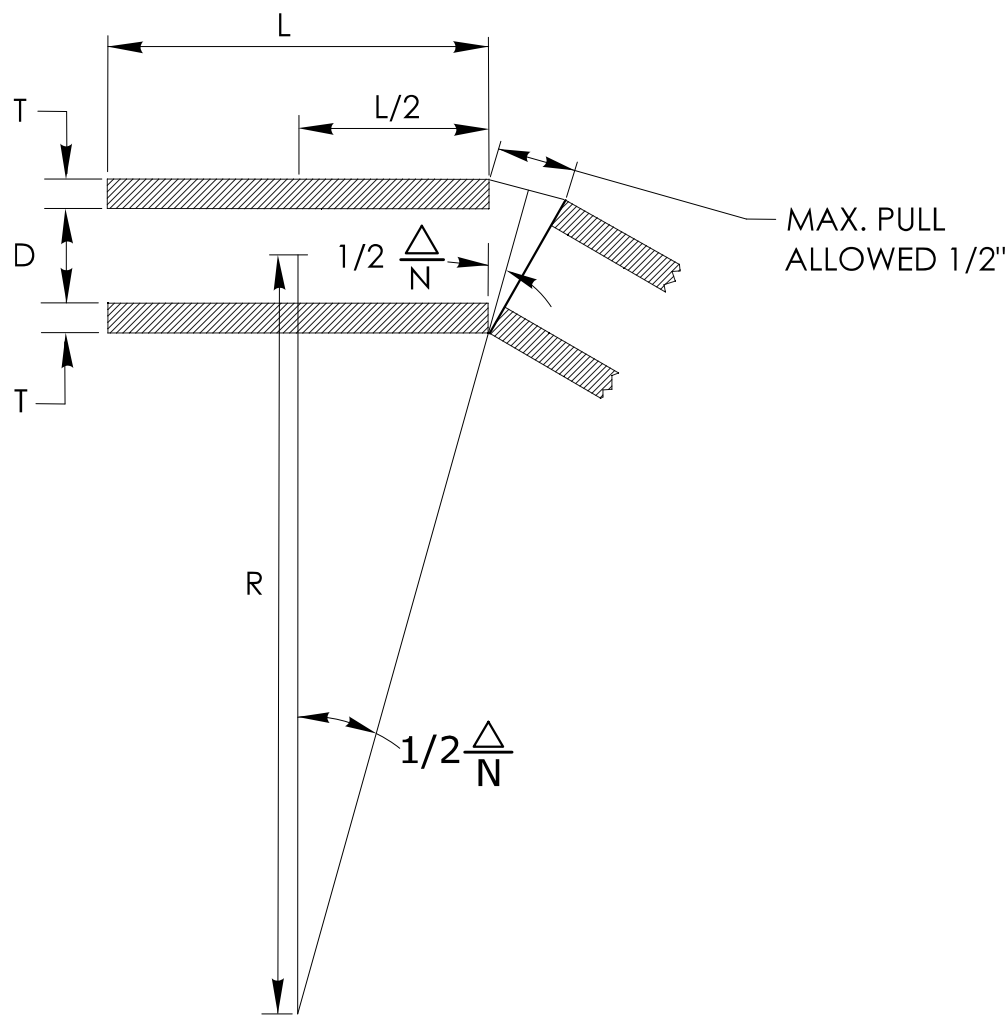
MANHOLE COVER WITH DIAMOND PATTERN



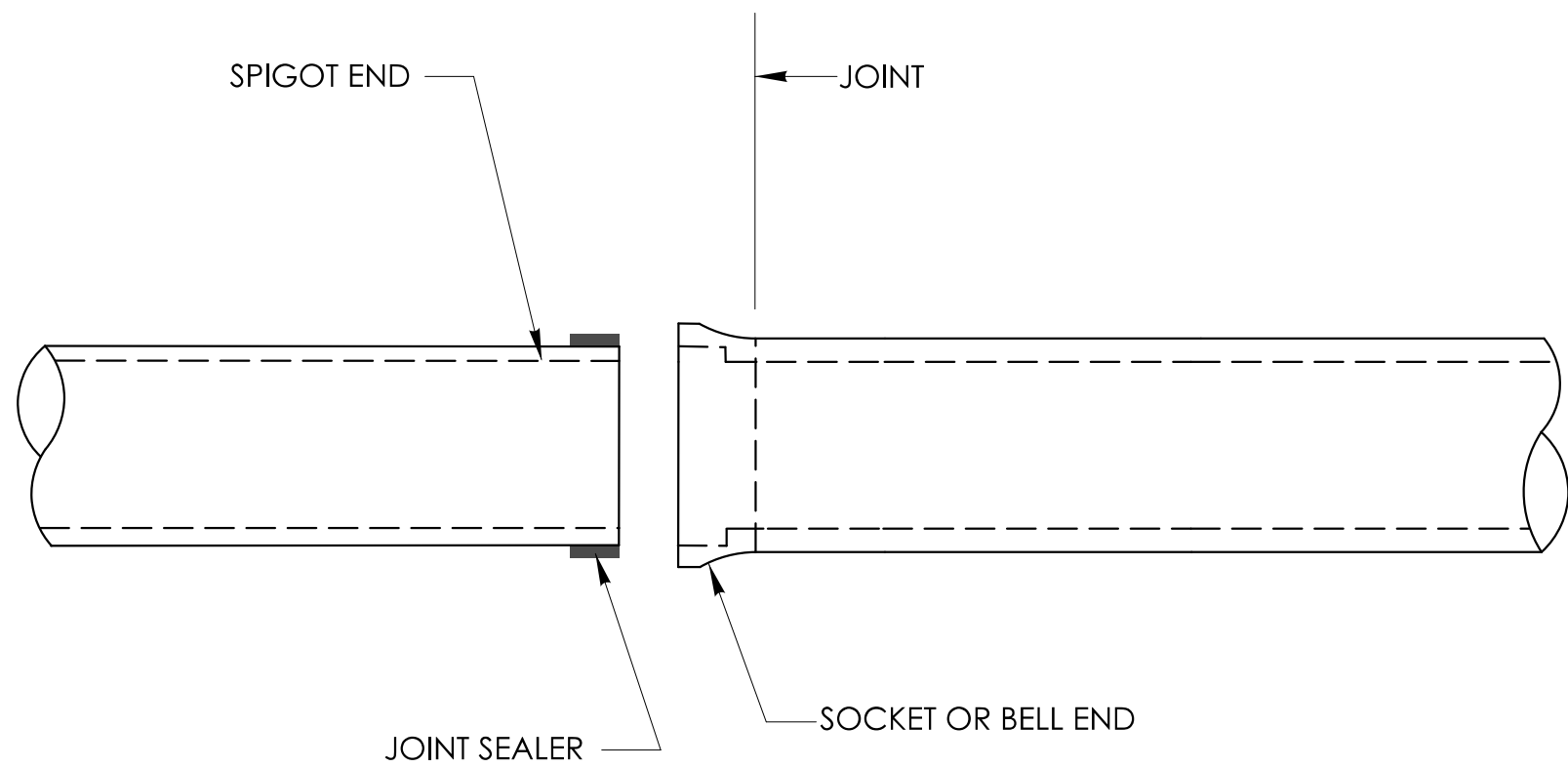
CONCRETE PIPE ASSEMBLY AT THE JOINT



CURVED ALIGNMENT USING DEFLECTED STRAIGHT PIPE FOR MAXIMUM PULL 1/2"



DETAIL A DEFLECTING STANDARD FOR RCP



STANDARD CONNECTION FOR CONCRETE PIPE

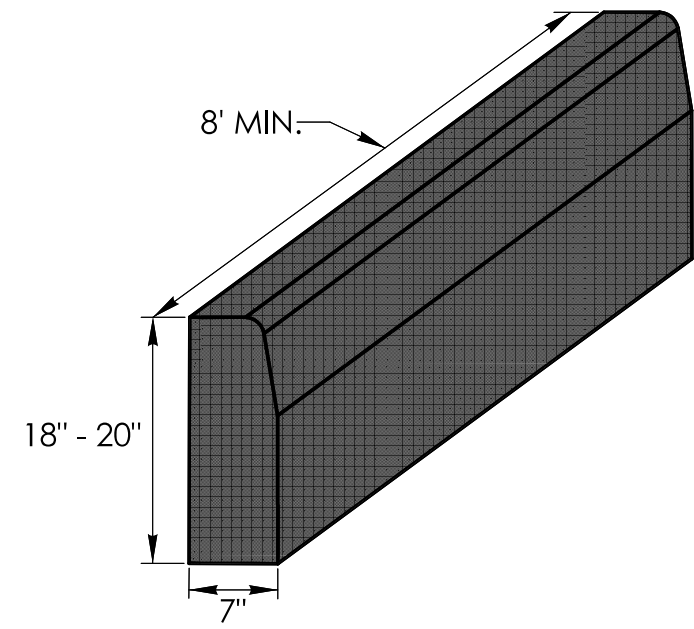
MINIMUM RADII FOR RCP PIPE ON CURVED ALIGNMENT

DIAMETER (D)	MINIMUM RADII USING 8' PIPE LENGTHS
IN.	FT.
15	337
18	392
21	401
24	452
30	617
36	729
42	842
48	953
54	1066
60	1178
72	1403

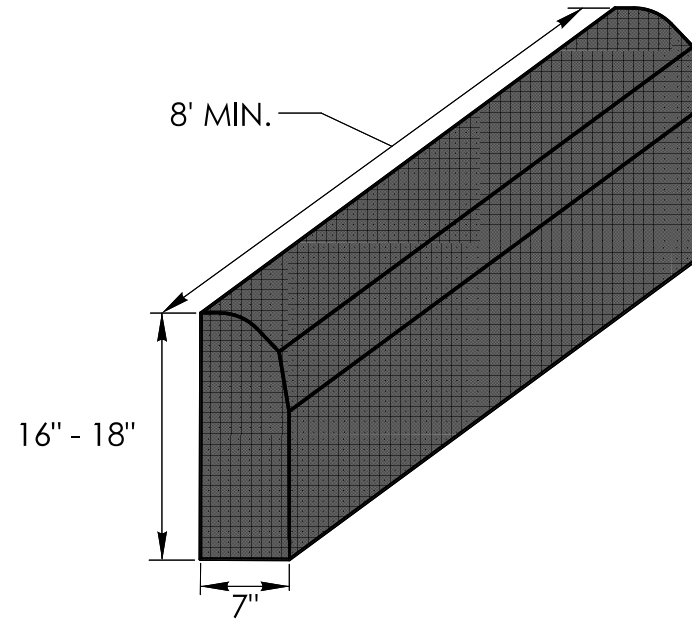
- NOTES:**
1. N IS THE NUMBER OF PIPE SEGMENTS
  2. D IS PIPE DIAMETER
  3. L IS LENGTH OF PIPE
  4. T IS PIPE THICKNESS
  5.  $\Delta$  IS THE DEGREE OF CURVATURE





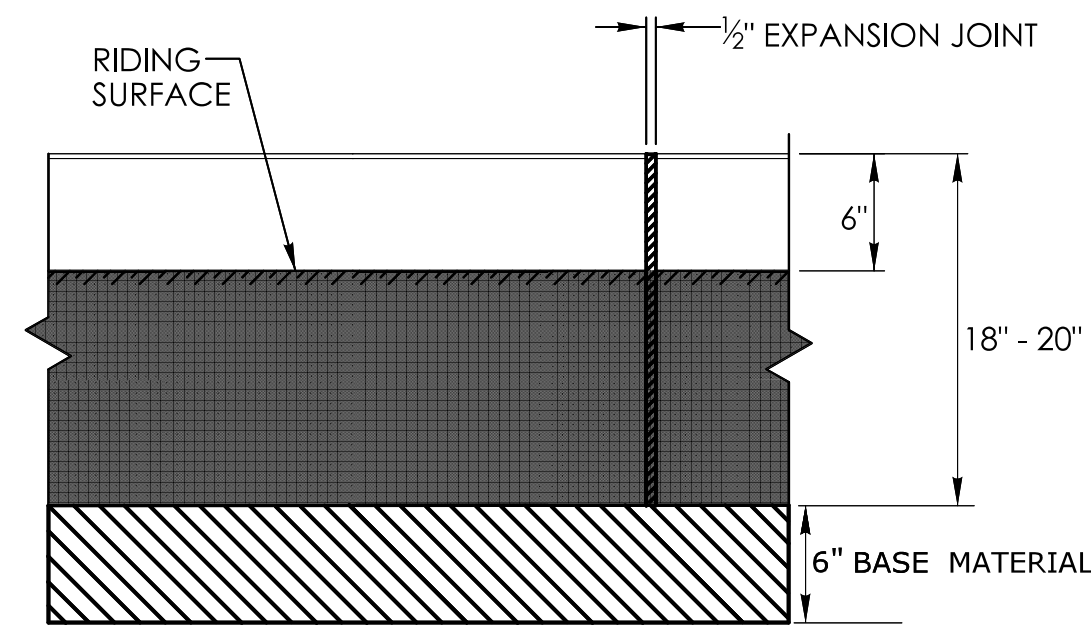


CONCRETE CURBING (6" REVEAL)

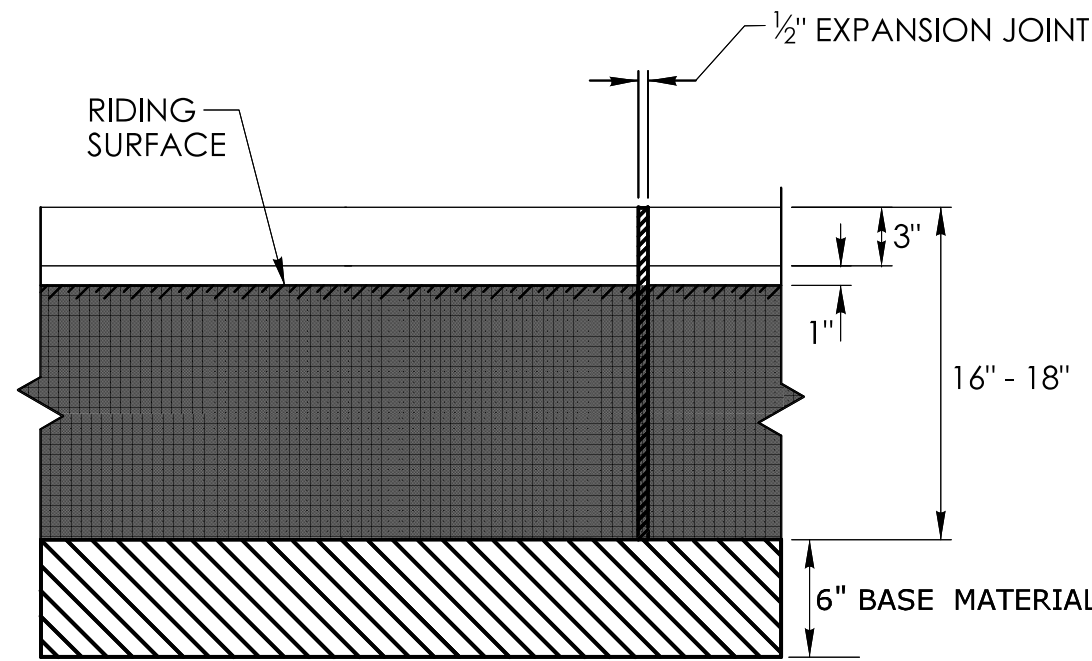


CONCRETE PARK CURBING (4" REVEAL)

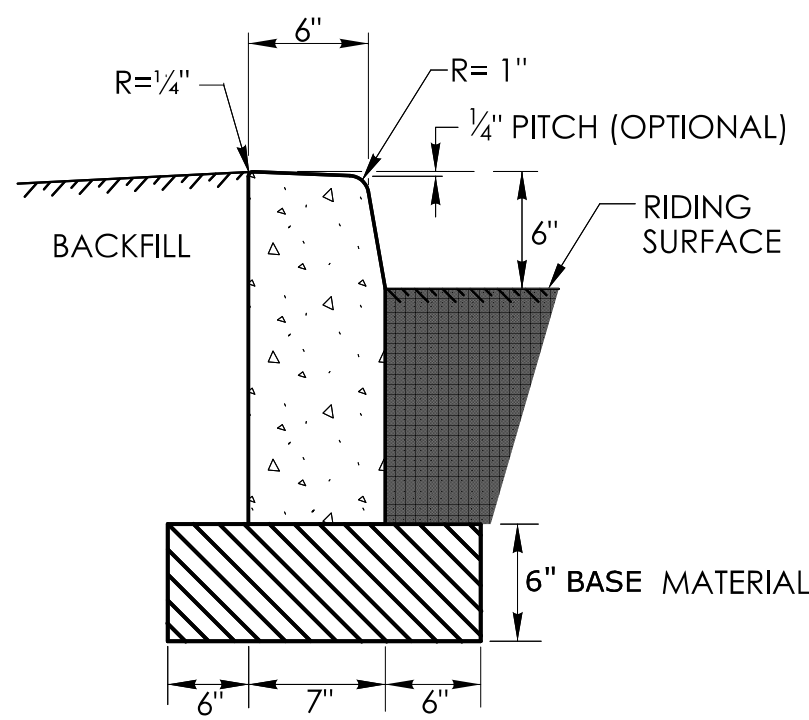
**GENERAL NOTE:**  
1. PRECAST CONCRETE CURBING MAY BE CAST BY THE MANUFACTURER WITH OPTIONAL LIFTING AND DOWEL BAR HOLES.



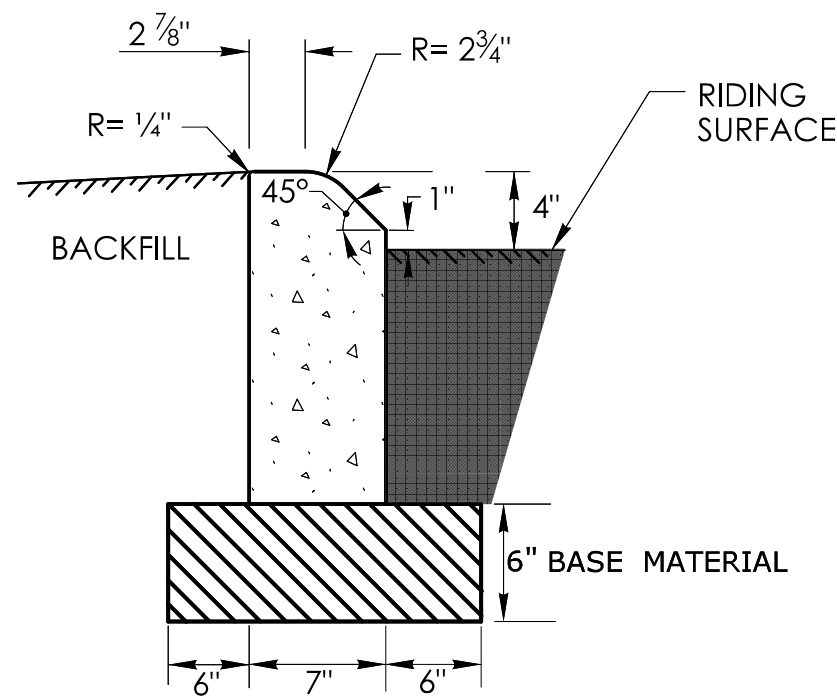
FRONT  
ELEVATION



FRONT  
ELEVATION

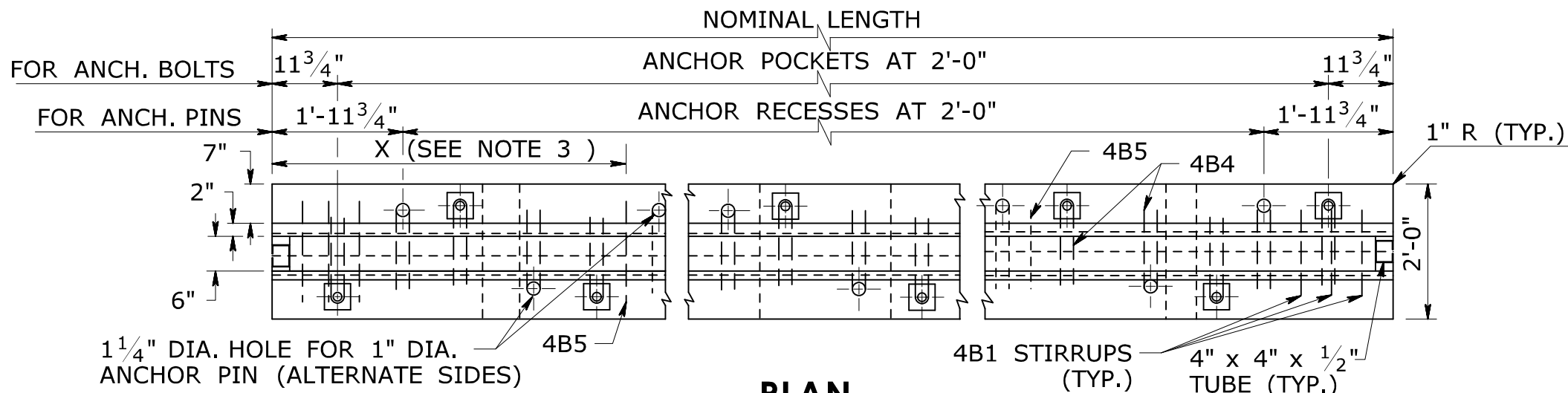


SECTION

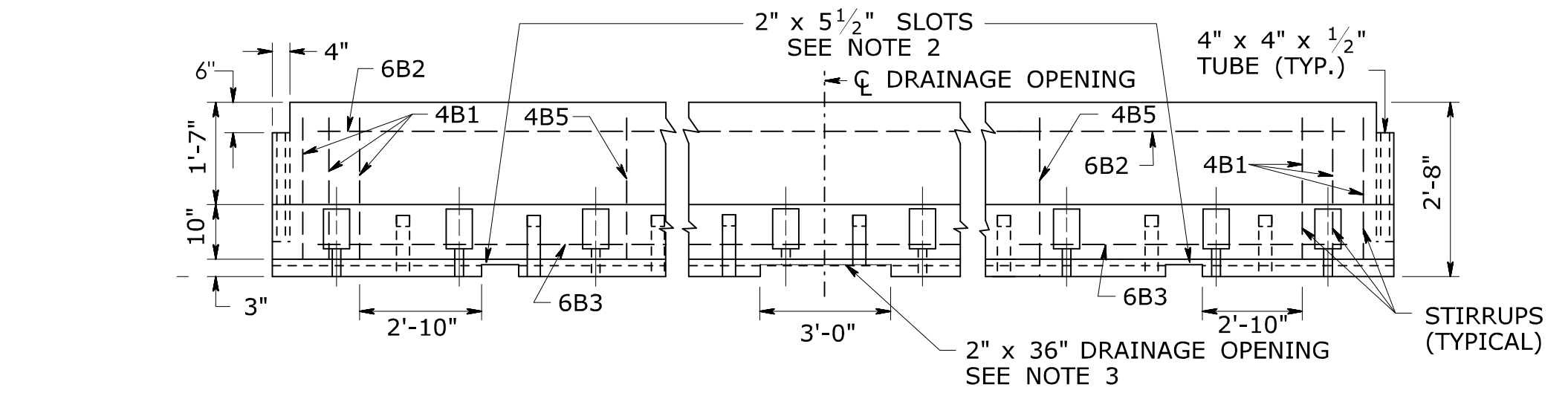


SECTION

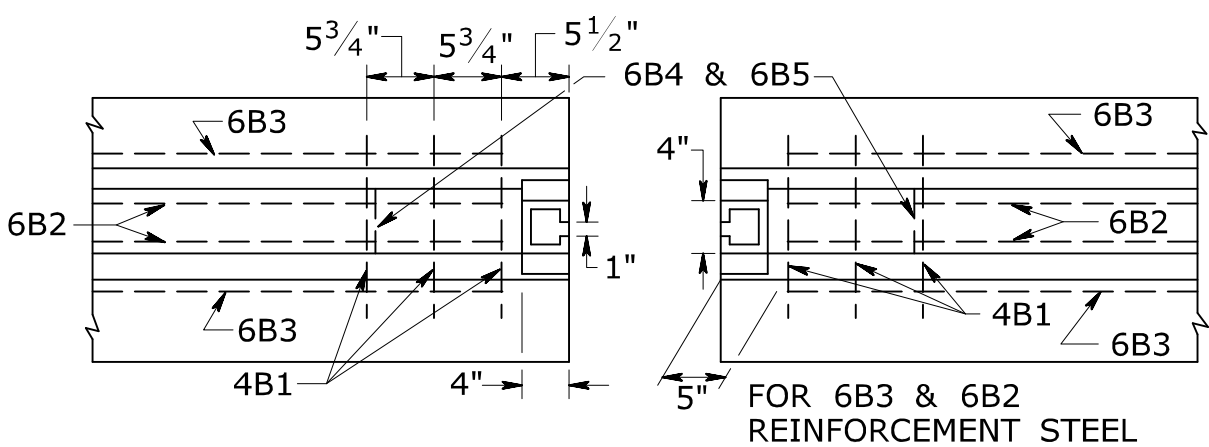




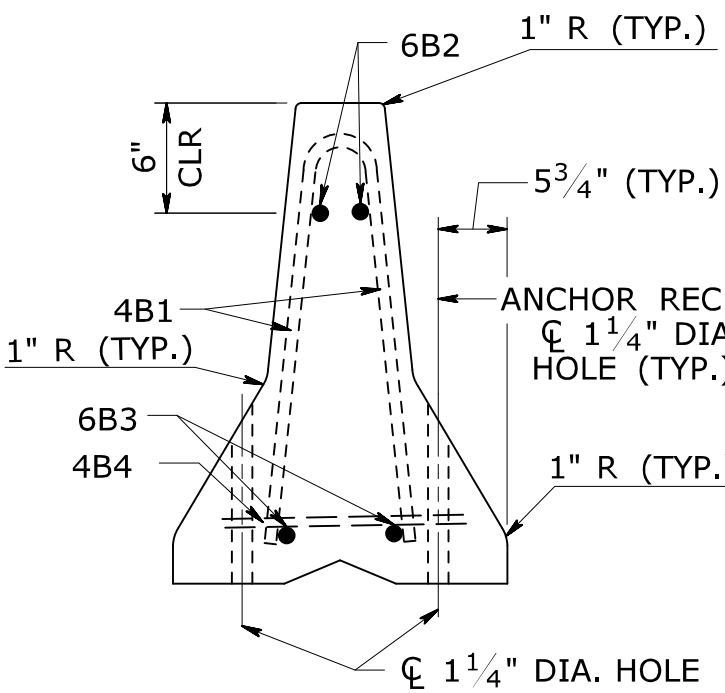
PLAN



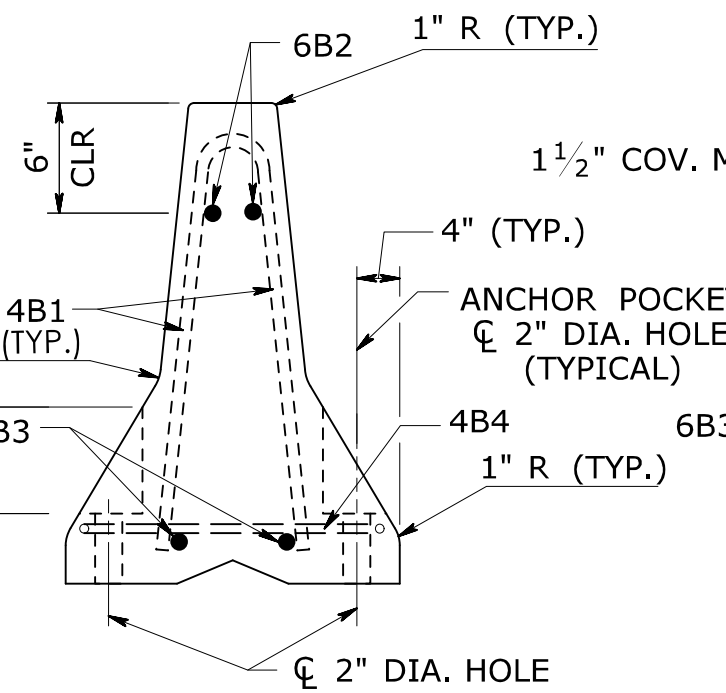
ELEVATION



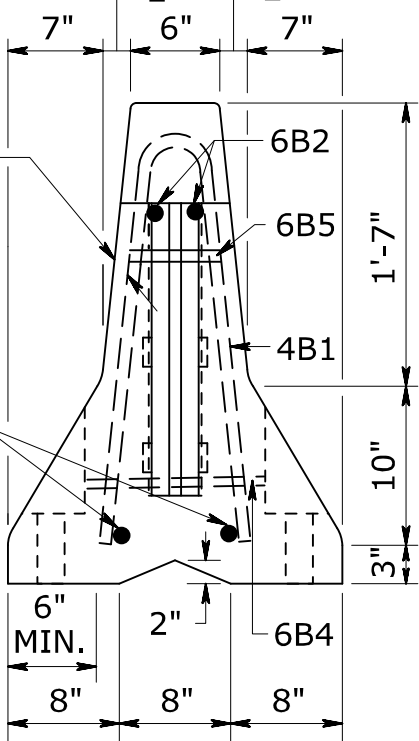
PLAN - BARRIER END



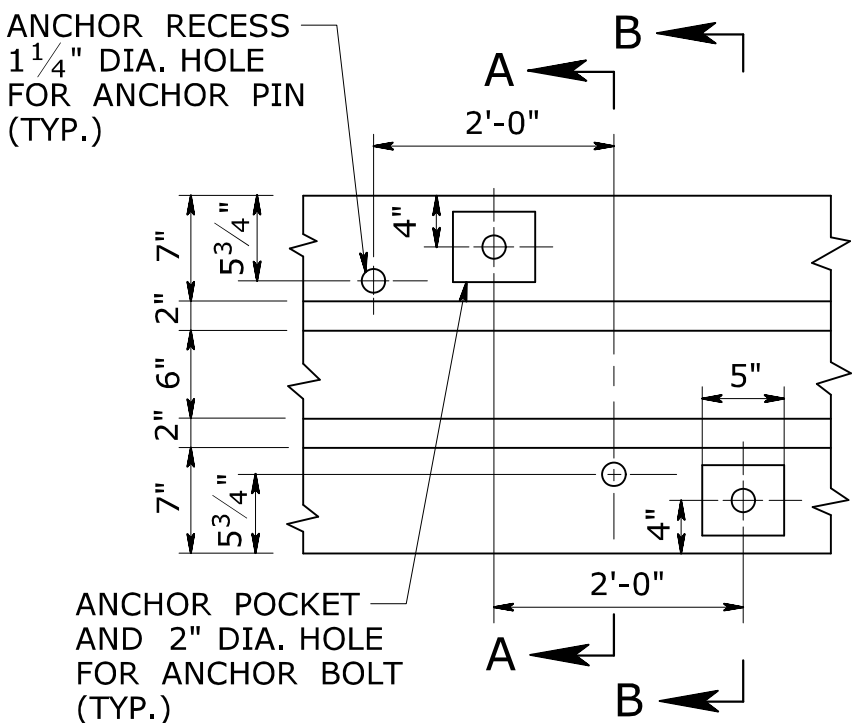
SECTION A-A



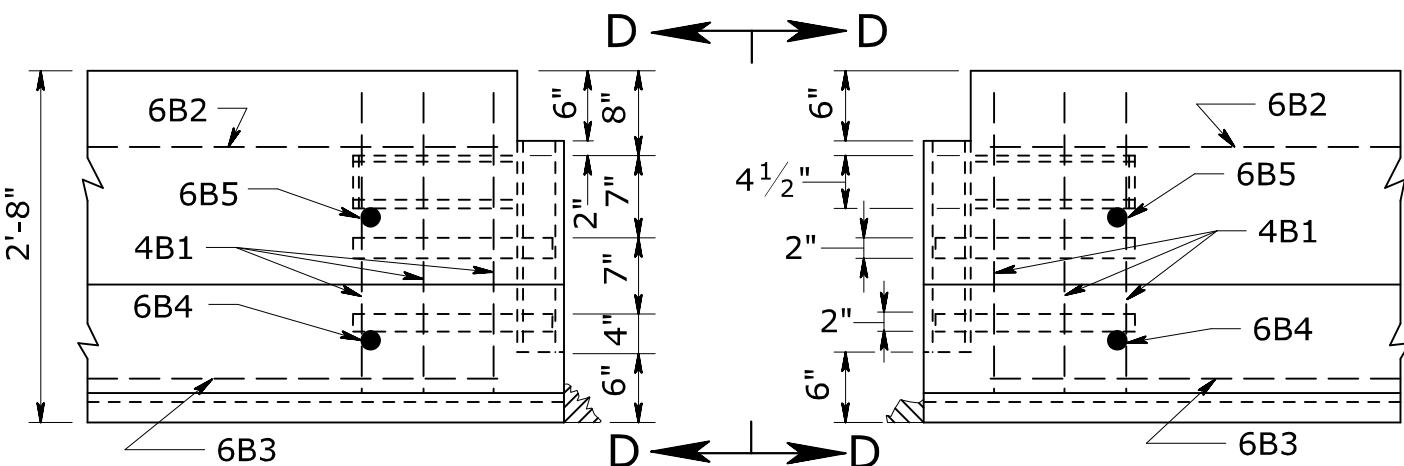
SECTION B-B



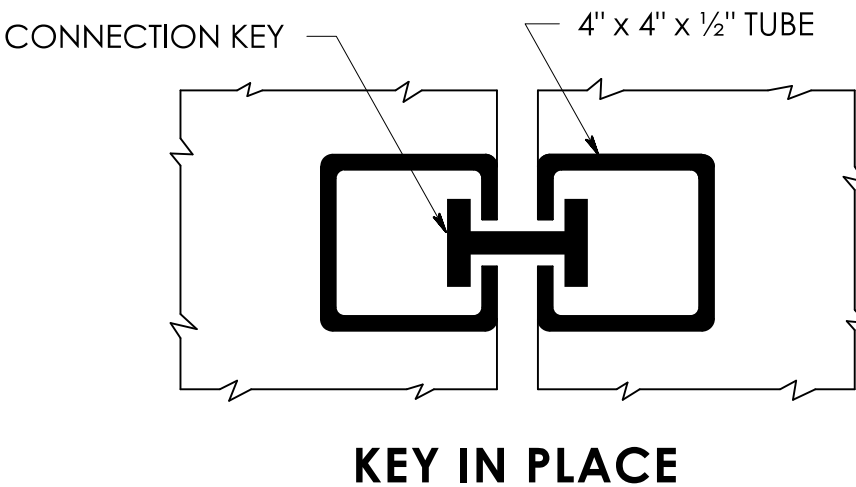
SECTION D-D



PLAN - ANCHOR RECESS/POCKET  
SEE NOTE 5



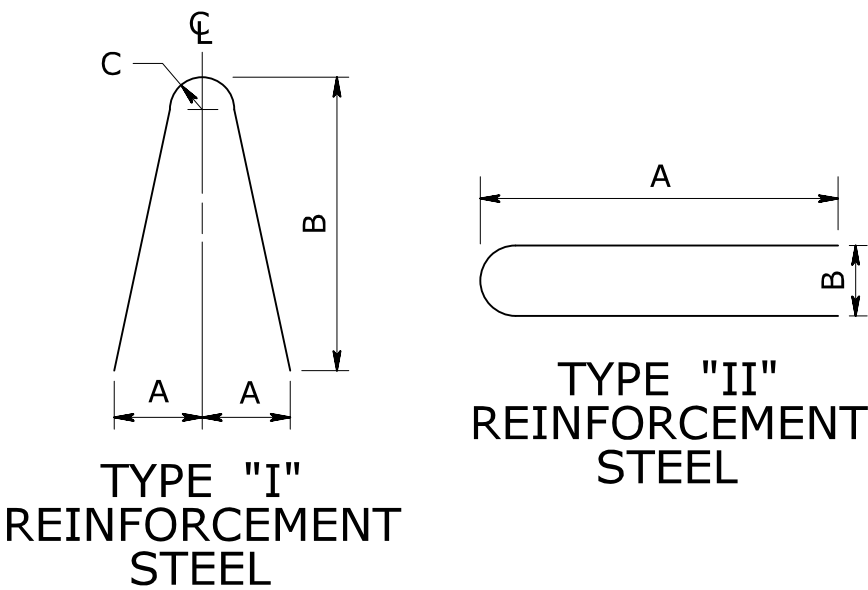
ELEVATION



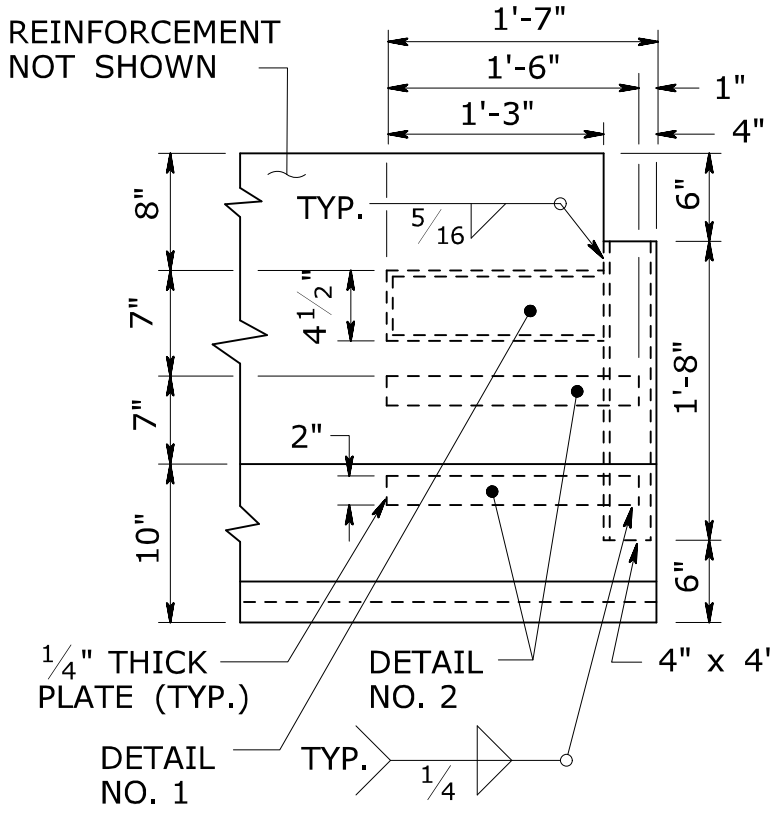
KEY IN PLACE

TABLE OF VARIABLE REINFORCEMENT STEEL			
NOMINAL LENGTH OF BARRIER UNIT	MARK	"X"	NO. EACH SECTION
20'	4B4	N.A.	19
20'	4B5	6'-11"	2
18'	4B4	N.A.	17
18'	4B5	6'-5"	2
16'	4B4	N.A.	15
16'	4B5	5'-11"	2
14'	4B4	N.A.	13
14'	4B5	7'-0"	1
12'	4B4	N.A.	11
12'	4B5	6'-0"	1
10'	4B4	N.A.	9
10'	4B5	5'-0"	1
8'	4B4	N.A.	7
8'	4B5	-	0
"X" DISTANCE FROM END OF BARRIER TO 4B5 REINFORCEMENT STEEL			

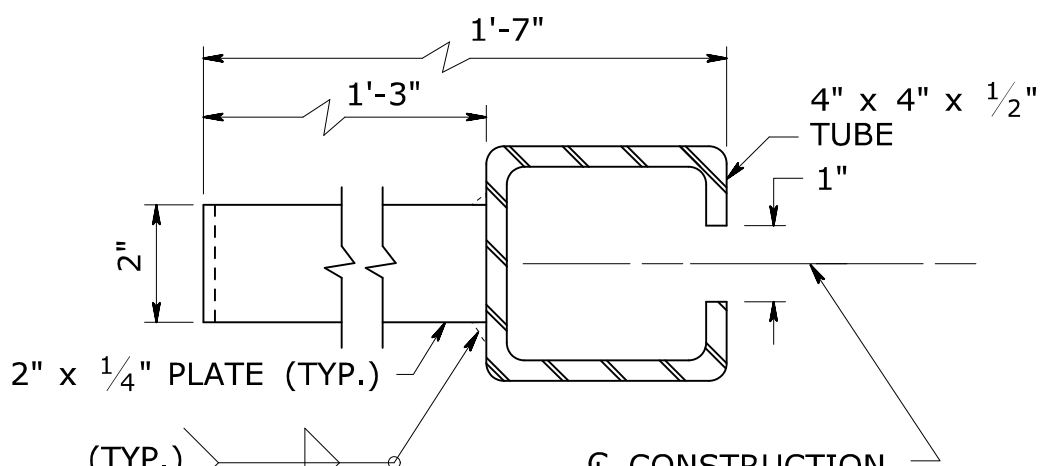
TEMPORARY TRAFFIC BARRIER



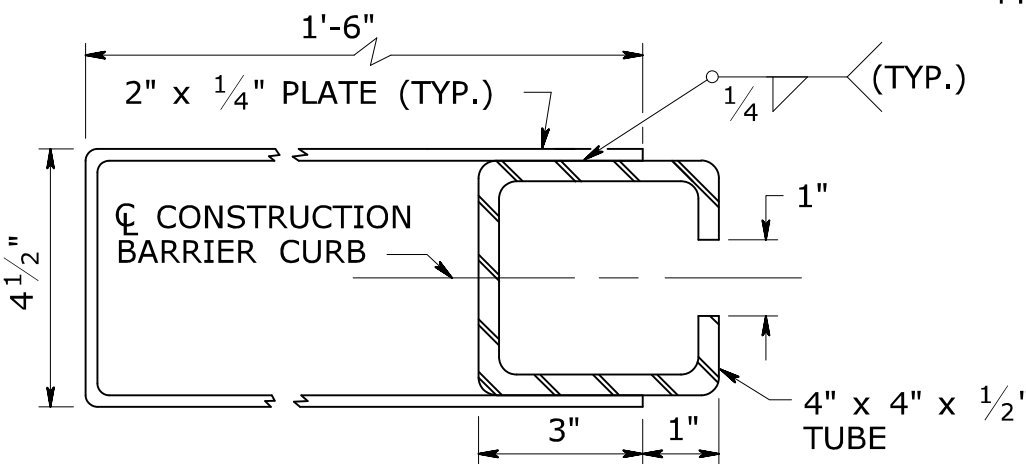
REINFORCEMENT STEEL LIST (EACH BARRIER SECTION)							
MARK	SIZE	NUMBER IN EACH SECTION	LENGTH	TYPE	A	B	C
4B1	#4	6	4'-11"	I	5"	26"	2"
4B4	#4	SEE NOTE 4	3'-1"	II	15 1/2"	4"	
4B5	#4	SEE NOTE 4	4'-11"	I	5"	26"	2"
6B2	#6	2	SEE NOTE 4	STR.			
6B3	#6	2	SEE NOTE 4	STR.			
6B4	#6	2	1'-2"	STR.			
6B5	#6	2	0'-6"	STR.			



ELEVATION

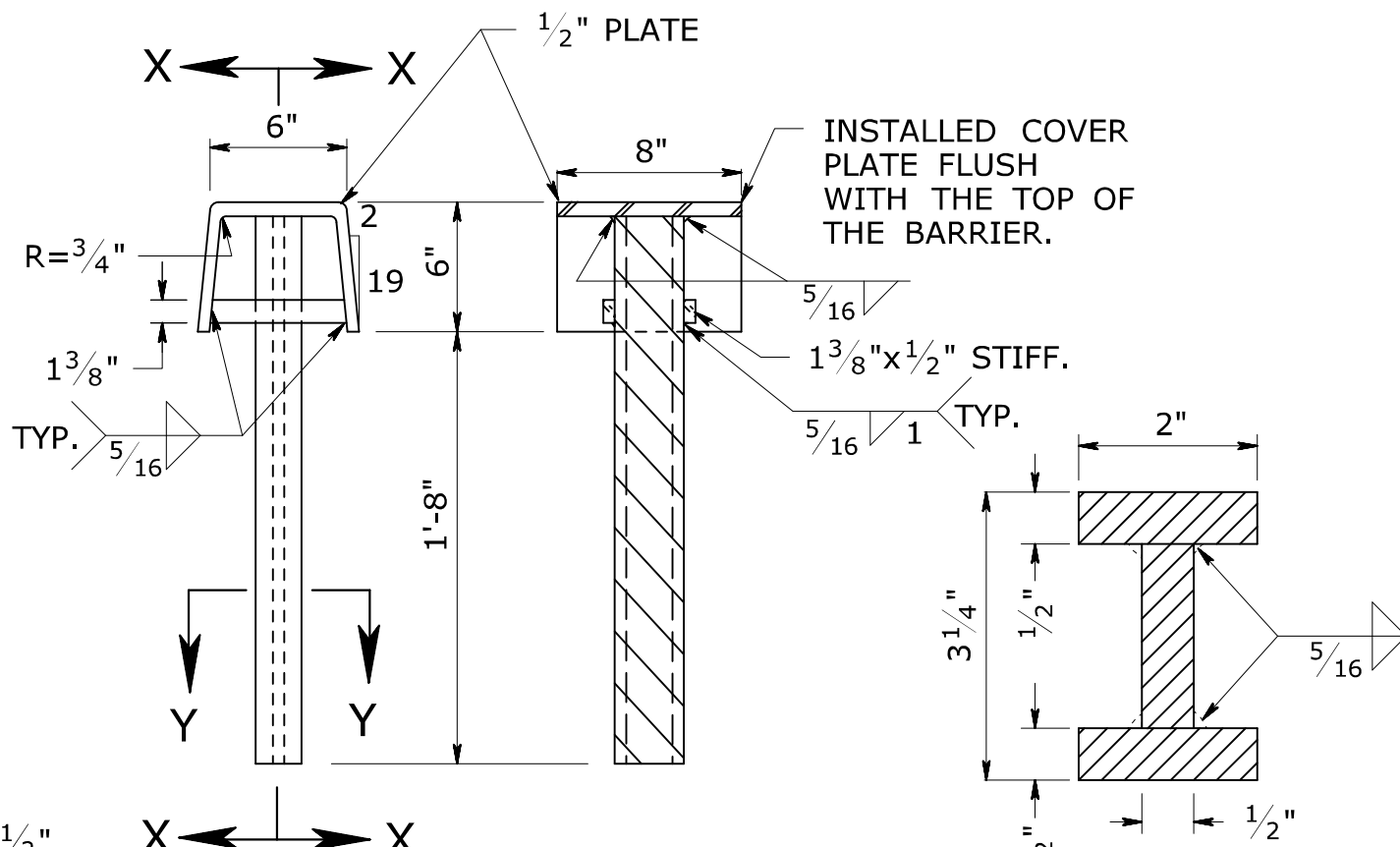


PLAN VIEW  
DETAIL NO. 1



PLAN VIEW  
DETAIL NO. 2

TEMPORARY TRAFFIC BARRIER CONNECTION DETAILS



SECTION X-X  
SECTION Y-Y  
CONNECTION KEY

GENERAL NOTES:

- CONCRETE CLEAR COVER FOR REINFORCEMENT STEEL IS 1 1/2" (MIN.).
- 2" x 5 1/2" SLOTS - TWO REQUIRED IN SECTIONS 12 FEET AND GREATER. ONE REQUIRED IN 8 FOOT AND 10 FOOT SECTIONS.
- 2" x 36" DRAINAGE OPENING IS ONLY REQUIRED FOR TEMPORARY TRAFFIC BARRIER UNITS OF 20 FEET IN LENGTH, LOCATED IN MIDDLE OF THE BARRIER UNIT.
- A TEMPORARY TRAFFIC BARRIER UNIT IS 20 FEET IN LENGTH; HOWEVER OTHER LENGTHS MAY BE USED TO MEET FIELD CONDITIONS. THE NUMBER AND PLACEMENT OF THE 4B4 AND 4B5 REINFORCEMENT STEEL WILL VARY WITH THE LENGTH OF THE BARRIER UNIT AS SHOWN ON THE TABLE OF VARIABLE REINFORCEMENT STEEL. THE 6B2 AND 6B3 REINFORCEMENT STEEL TO BE PLACED 10 INCHES SHORTER THAN THE NOMINAL LENGTH OF THE BARRIER UNITS.
- ANCHOR RECESS HOLES OR ANCHOR POCKETS WITH ASSOCIATED REINFORCEMENT STEEL ARE ONLY REQUIRED FOR THE ASSOCIATED TEMPORARY TRAFFIC BARRIER (PINNED) OR TEMPORARY TRAFFIC BARRIER (BOLTED).

NOT TO SCALE

SIGNATURE BLOCK:  
OFFICE OF ENGINEERING  
2800 BERLIN TURNPIKE  
NEWINGTON, CT 06111

SUBMITTED BY:  
Digitally signed by  
Michael N. Calabrese, P.E.  
Date: 2024.12.16  
14:21:13-05'00'

APPROVED BY:  
Digitally signed by  
Michael N. Calabrese, P.E.  
Date: 2025.01.21  
13:41:21-05'00'



CONNECTICUT  
DEPARTMENT OF  
TRANSPORTATION

CTDOT  
STANDARD SHEET

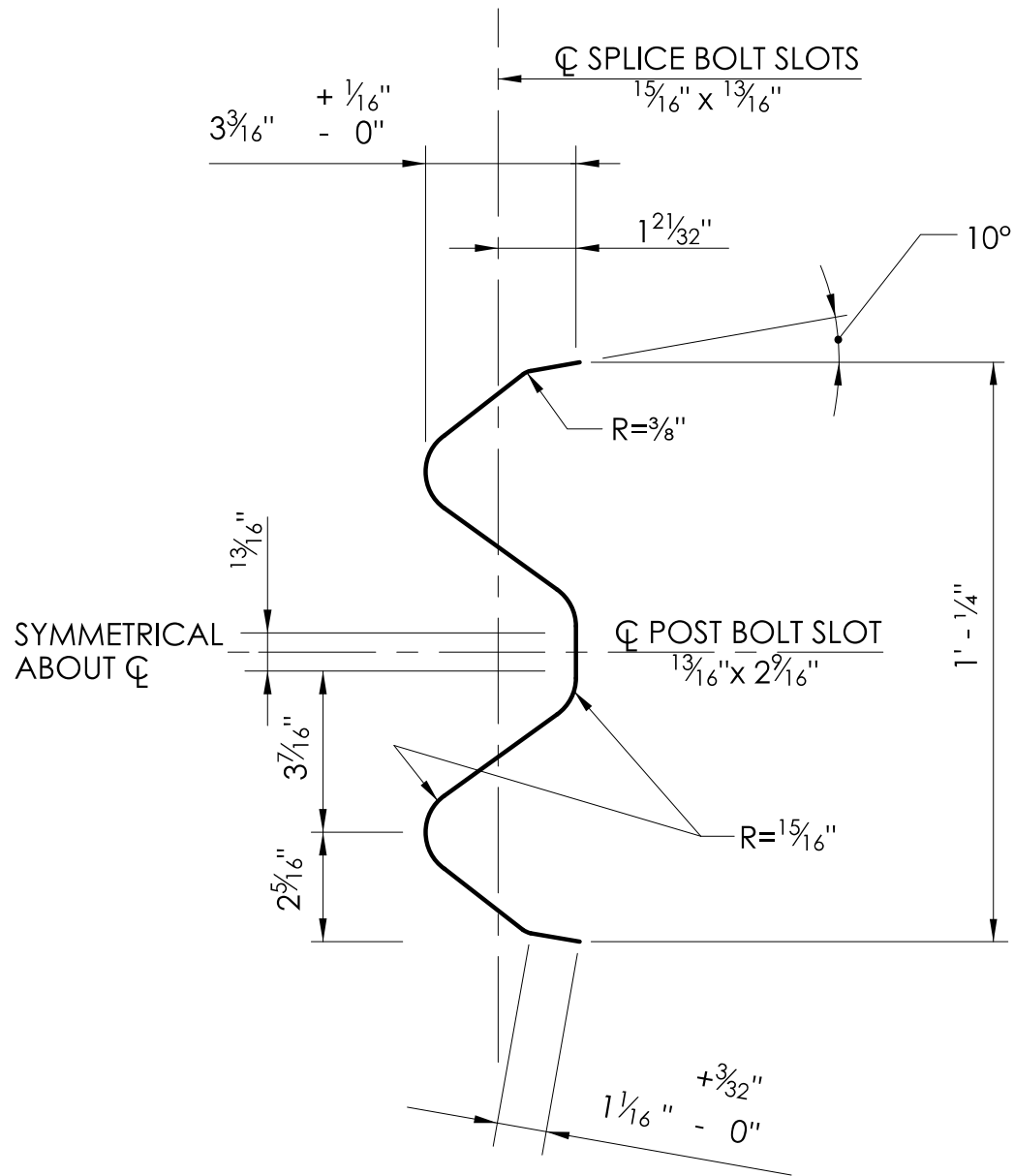
STANDARD SHEET TITLE:

TEMPORARY TRAFFIC BARRIER - DETAILS

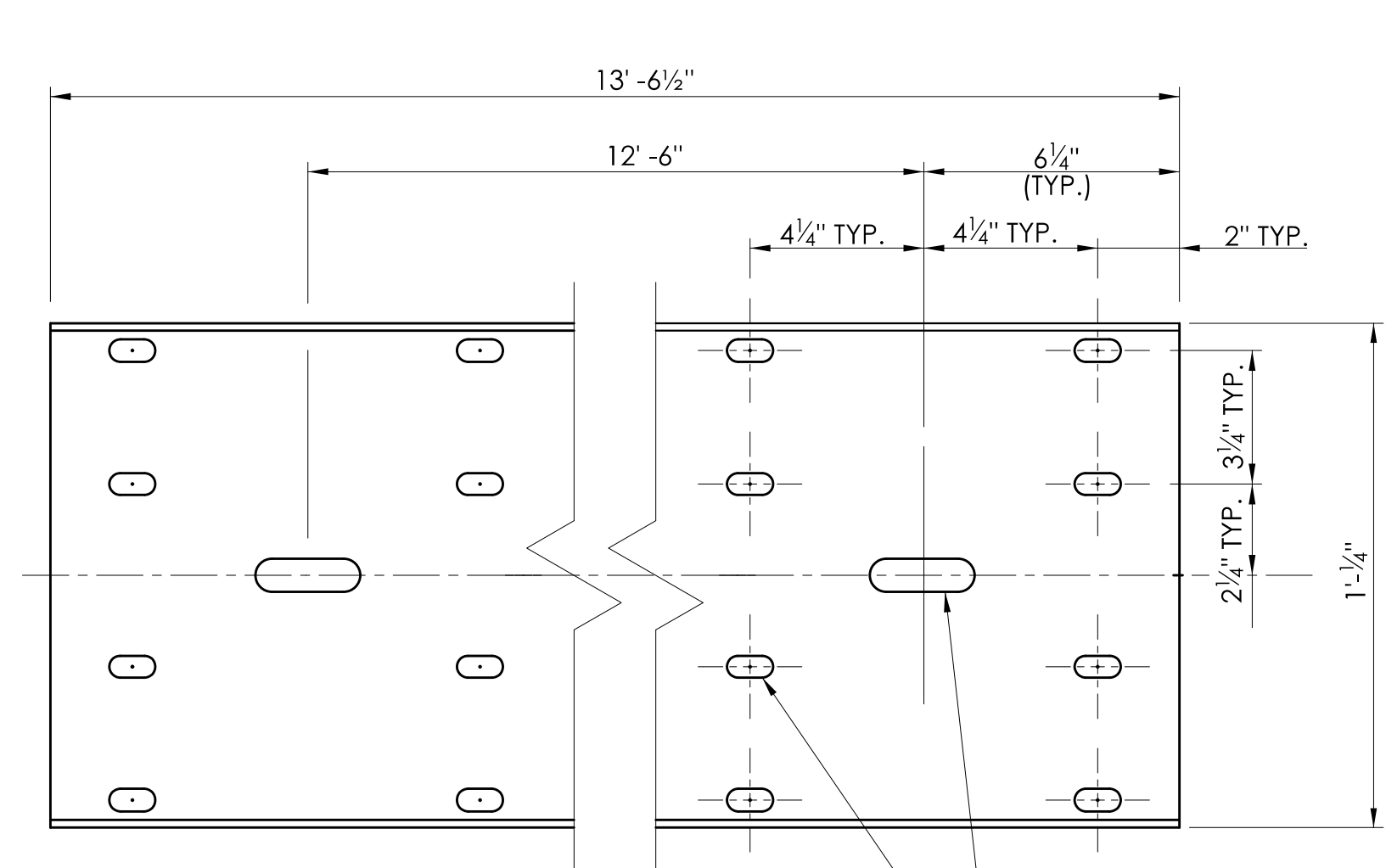
MASH 2016 COMPLIANT  
APPROVAL ID: 2021-01

STANDARD SHEET NO.:

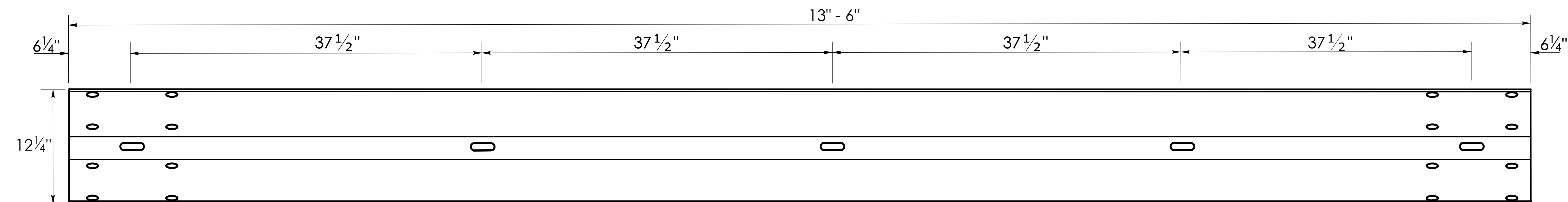
HW-822\_02a



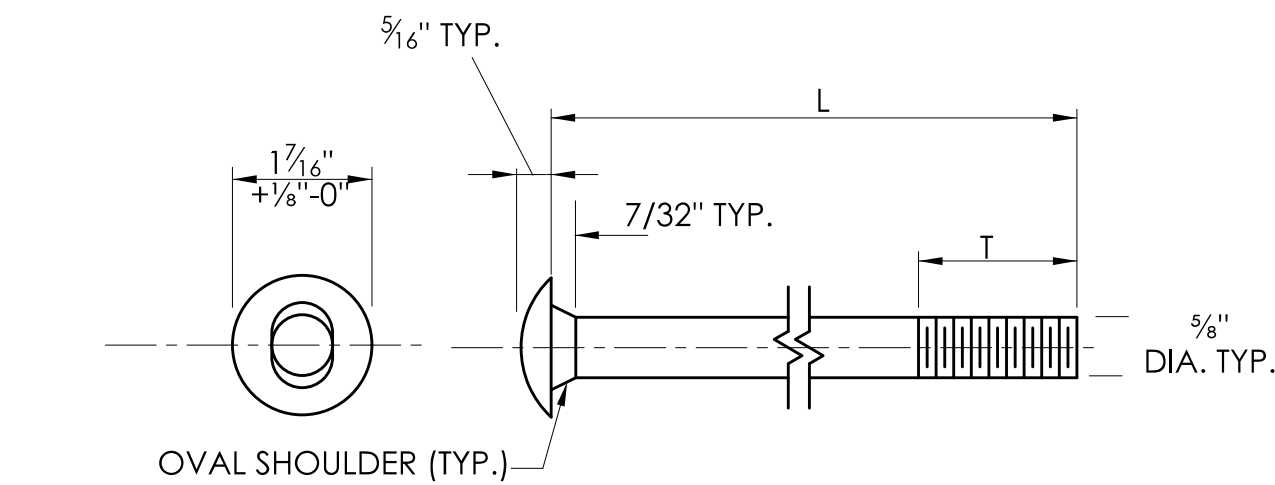
SECTION VIEW



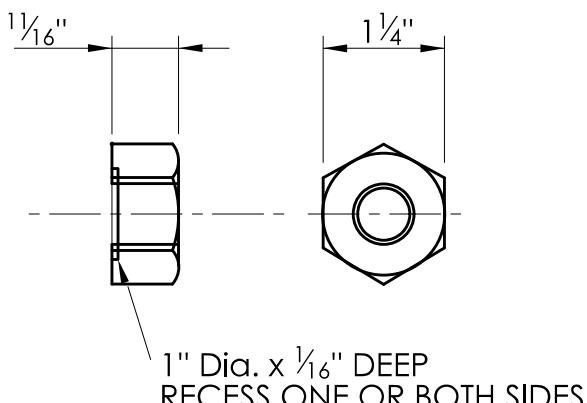
ELEVATION VIEW



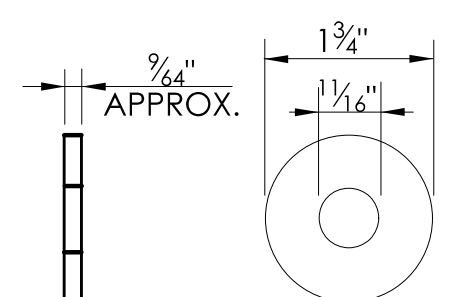
TYPICAL W-BEAM RAIL ELEMENT



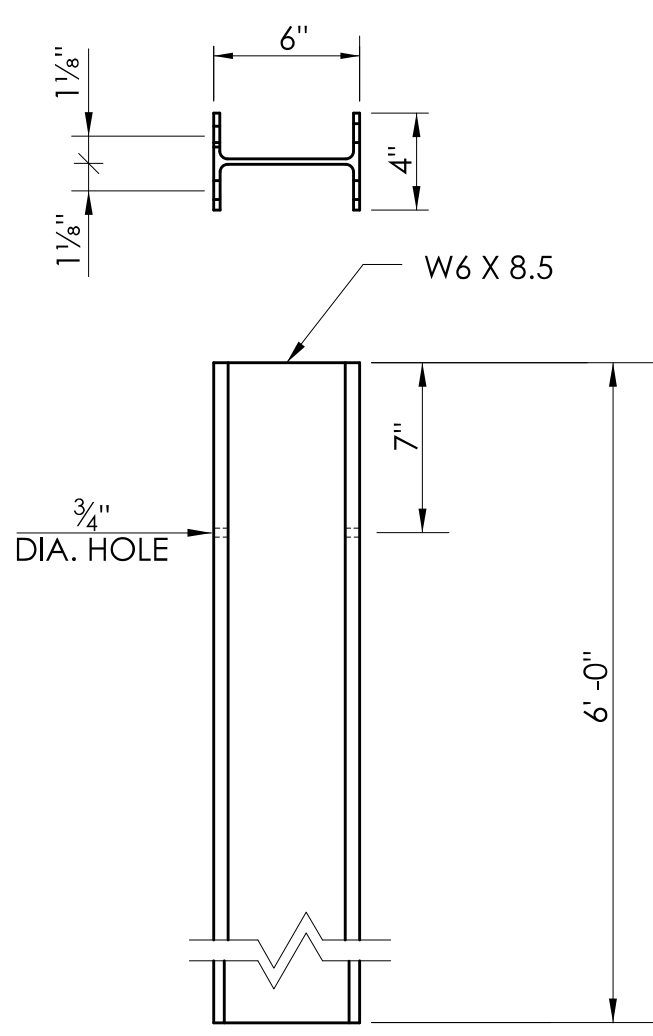
BUTTONHEAD BOLT



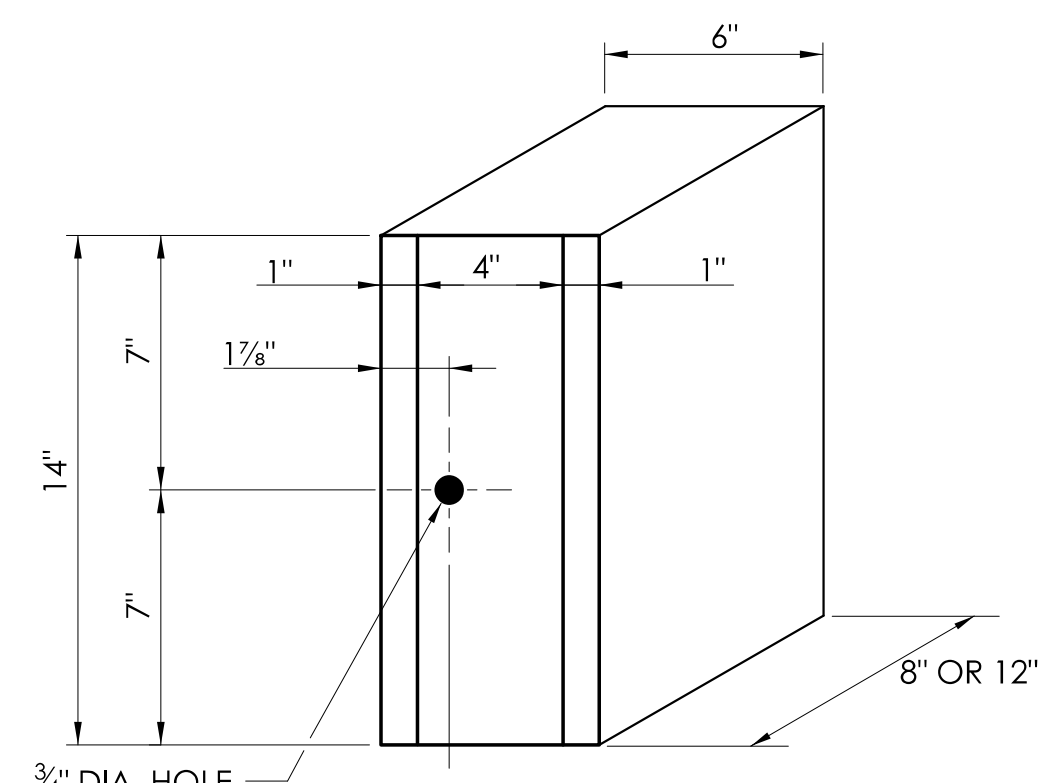
HEX NUT



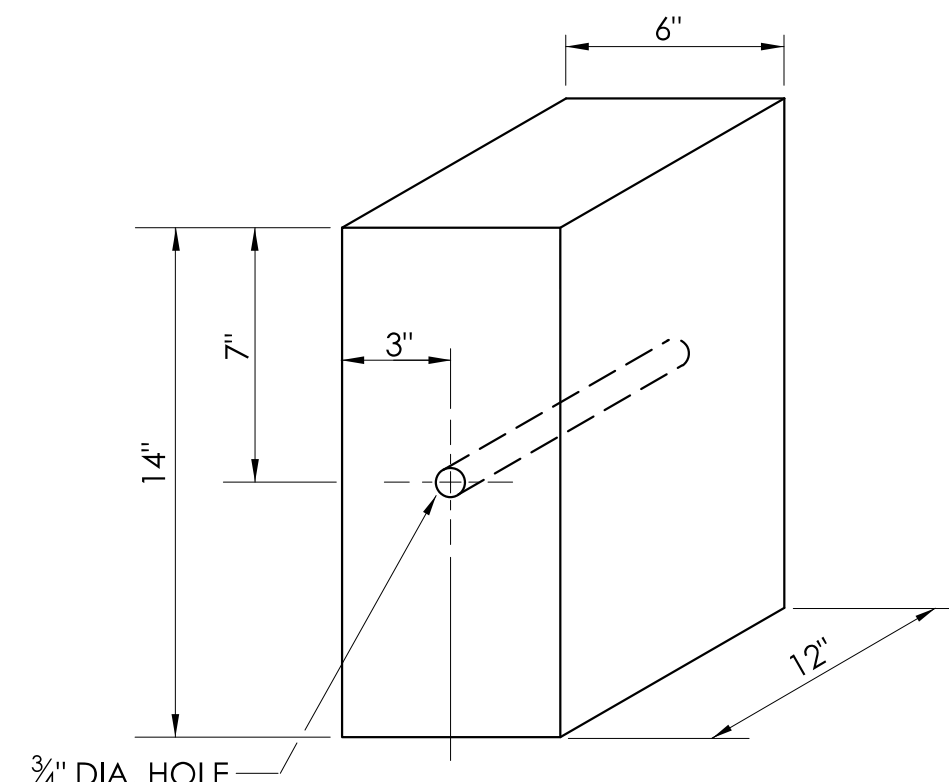
WASHER  
[FWC16a]



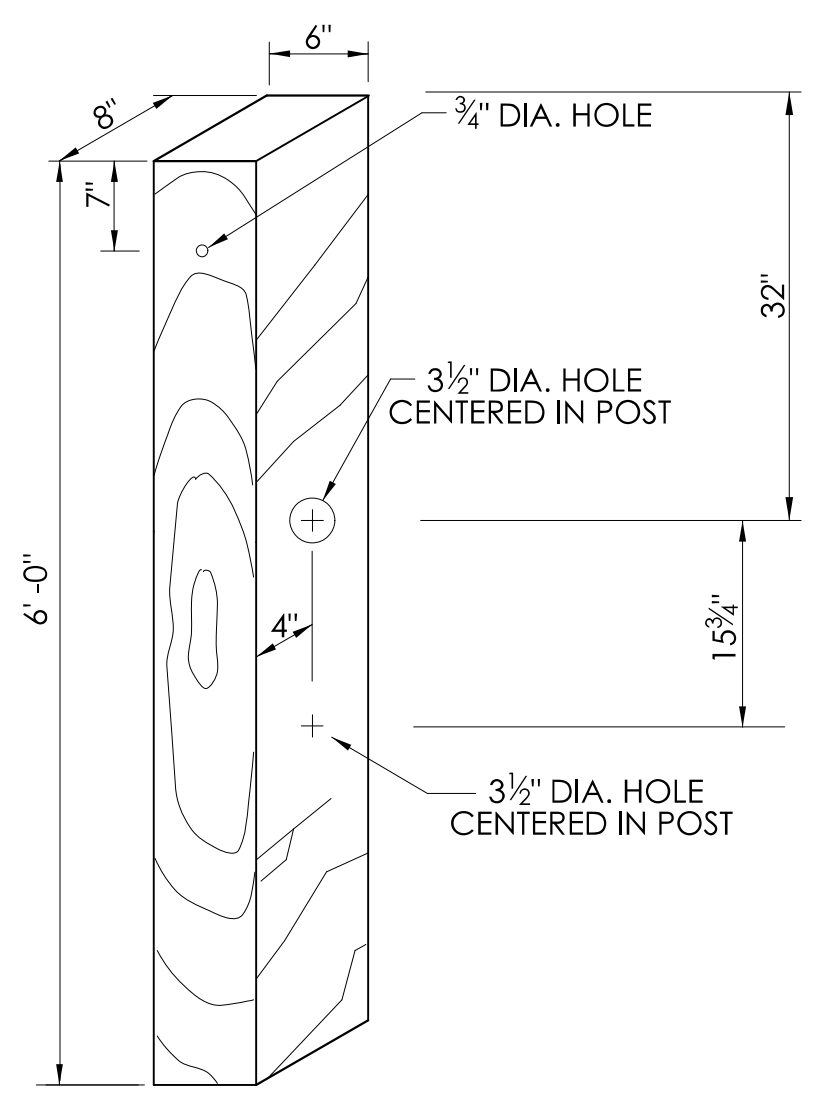
STEEL POST  
6' - 0" LONG



8" or 12" PLASTIC BLOCKOUT  
NOMINAL DIMENSIONS

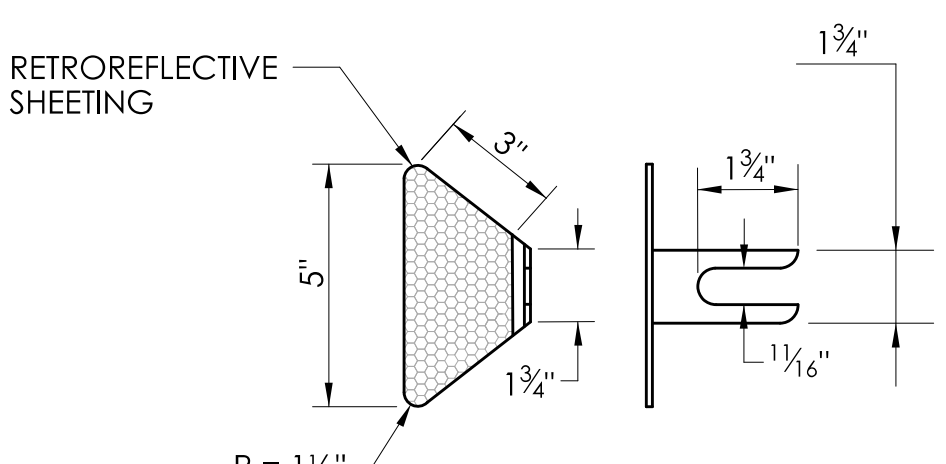


12" WOOD BLOCKOUT



CONTROL RELEASE TIMBER (CRT) POST  
6' - 0" LONG

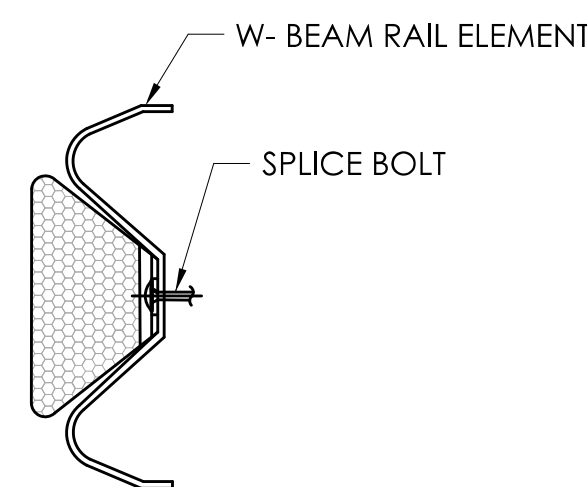
- GENERAL NOTES:**
- W6 x 9 POSTS MAY BE USED IN PLACE OF W6 x 8.5 POSTS.
  - W-BEAM GUIDERAIL SHALL USE CLASS A (12 GAUGE), TYPE II W-BEAM RAIL ELEMENTS.
  - SEVEN FOOT LONG STEEL POSTS (W6 X 8.5) ARE TO BE INSTALLED WHERE INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
  - ALL DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES



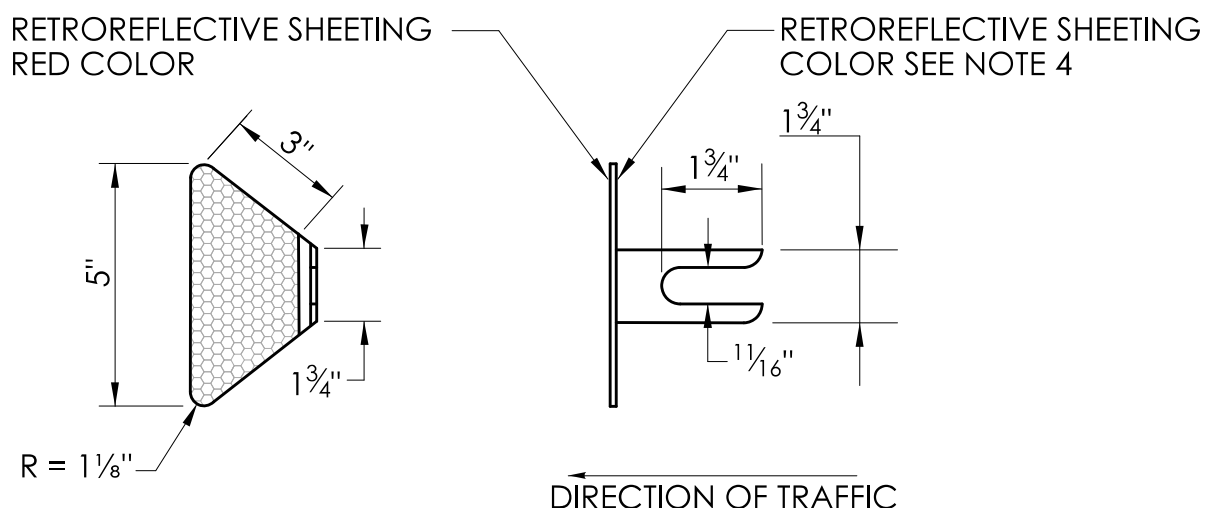
W-BEAM DELINEATOR

INSTALLATION NOTES:

- INSTALL W-BEAM DELINEATORS ON RAIL THAT IS PARALLEL TO AND NOT GREATER THAN 8' FROM THE EDGE OF THE ROADWAY. A MINIMUM OF THREE W-BEAM DELINEATORS SHALL BE INSTALLED ON ANY LENGTH OF GUIDERAIL.
- THE SPACING OF W-BEAM DELINEATORS IS 50 FEET, INSTALLED AT RAIL SPLICE LOCATIONS. SPACING IS 25 FEET ON RADII LESS THAN 300 FEET.
- NO W-BEAM DELINEATORS ARE PERMITTED WITHIN 75 FEET OF THE IMPACT HEAD OF ANY TANGENTIAL OR FLARED IMPACT ATTENUATION SYSTEM.
- RETROREFLECTIVE SHEETING SHALL BE WHITE EXCEPT ON THE LEFT SIDE OF DIVIDED STREETS, HIGHWAYS, RAMPS, AND ONE WAY ROADS IN THE DIRECTION OF TRAVEL WHERE IT SHALL BE YELLOW.
- FOR HIGHWAY OFF RAMP, INSTALL W-BEAM DOUBLE SIDED DELINEATORS ACCORDING TO INSTALLATION REQUIREMENTS STATED BELOW FOR W-BEAM DOUBLE SIDED DELINEATORS.



W-BEAM DELINEATOR  
INSTALLATION



W-BEAM DOUBLE SIDED DELINEATOR  
FOR HIGHWAY OFF RAMPS

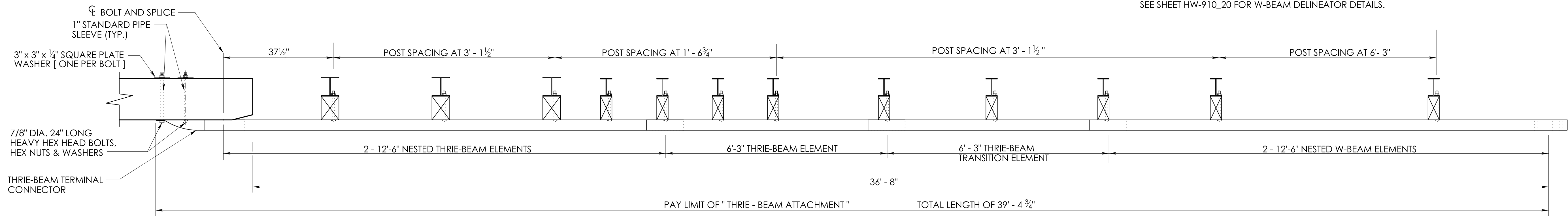
INSTALLATION NOTES:

- INSTALL W-BEAM DOUBLE SIDED DELINEATORS ON HIGHWAY OFF RAMP'S W-BEAM GUIDERAIL BETWEEN THE PAINTED TRAFFIC STOP LINE TO THE FARTHEST "WRONG WAY" SIGNS FROM THE INTERSECTION.
- INSTALL THE W-BEAM DOUBLE SIDED DELINEATORS AT 6'-3" SPACING.
- NO W-BEAM DOUBLE SIDED DELINEATORS ARE PERMITTED WITHIN 75 FEET OF THE IMPACT HEAD OF ANY TANGENTIAL OR FLARED IMPACT ATTENUATION SYSTEM.
- RETROREFLECTIVE SHEETING COLOR SHALL BE RED ON BACKSIDE ( NOT FACING NORMAL DIRECTION OF TRAFFIC) WITH FRONT SIDE HAVING WHITE EXCEPT ON THE LEFT SIDE OF RAMPS WHERE IT SHALL BE YELLOW.

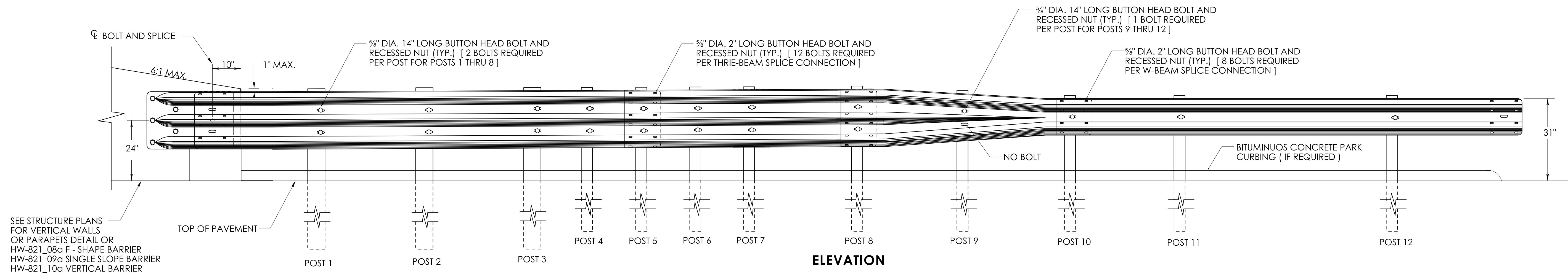


GENERAL NOTES:

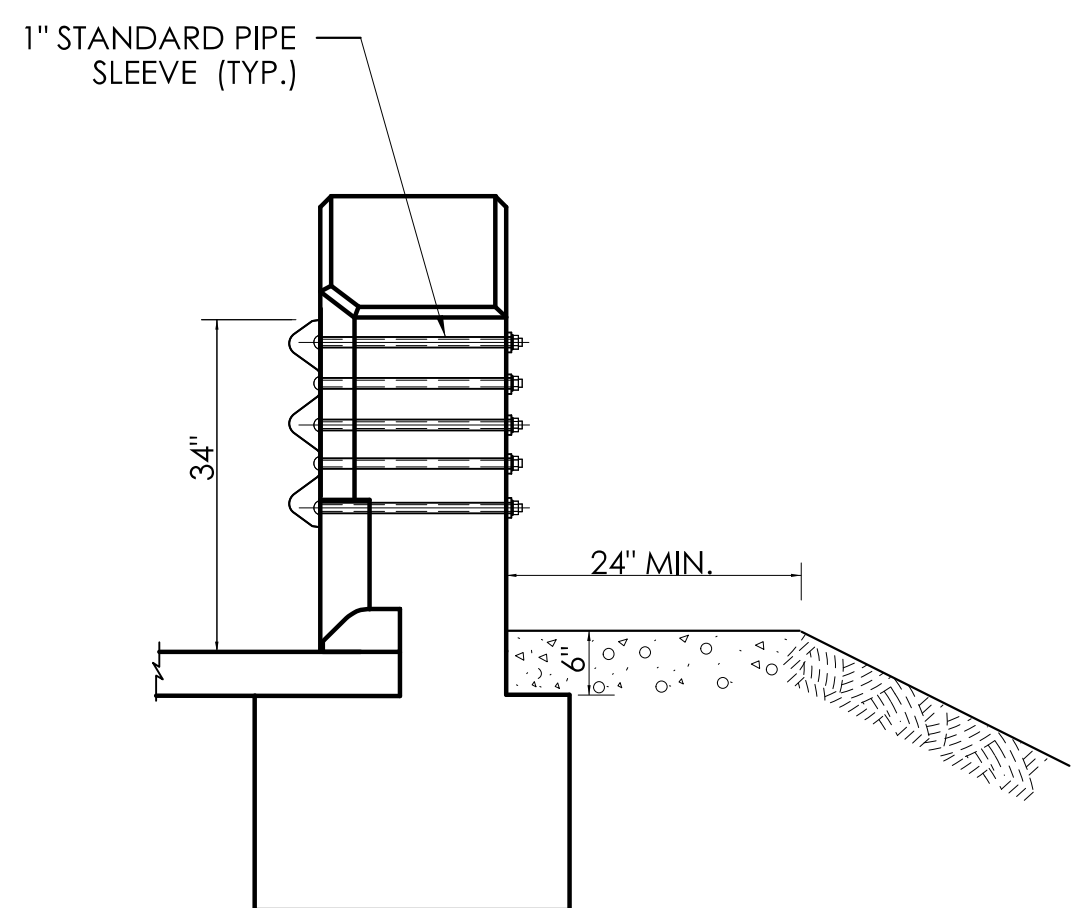
1. PROVIDE 2 FOOT MINIMUM EMBANKMENT BETWEEN THE BACK OF THE GUIDERAIL POST(S) / CONCRETE BARRIER AND THE BREAK IN THE FILL SLOPE.
2. INSTALL THRIE - BEAM TERMINAL CONNECTOR BETWEEN NESTED GUIDERAIL ELEMENTS, EXCEPT FOR SINGLE DIRECTION ROADWAY APPLICATION ONLY WHERE THE THRIE - BEAM TERMINAL CONNECTOR IS INSTALLED OUTSIDE OF NESTED GUIDERAIL ELEMENTS ON THE TRAILING END.
3. DELINEATORS SHALL BE INSTALLED ON THE POST CLOSEST TO THE DESIGNATED SPACING. SEE SHEET HW-910\_20 FOR W-BEAM DELINEATOR DETAILS.



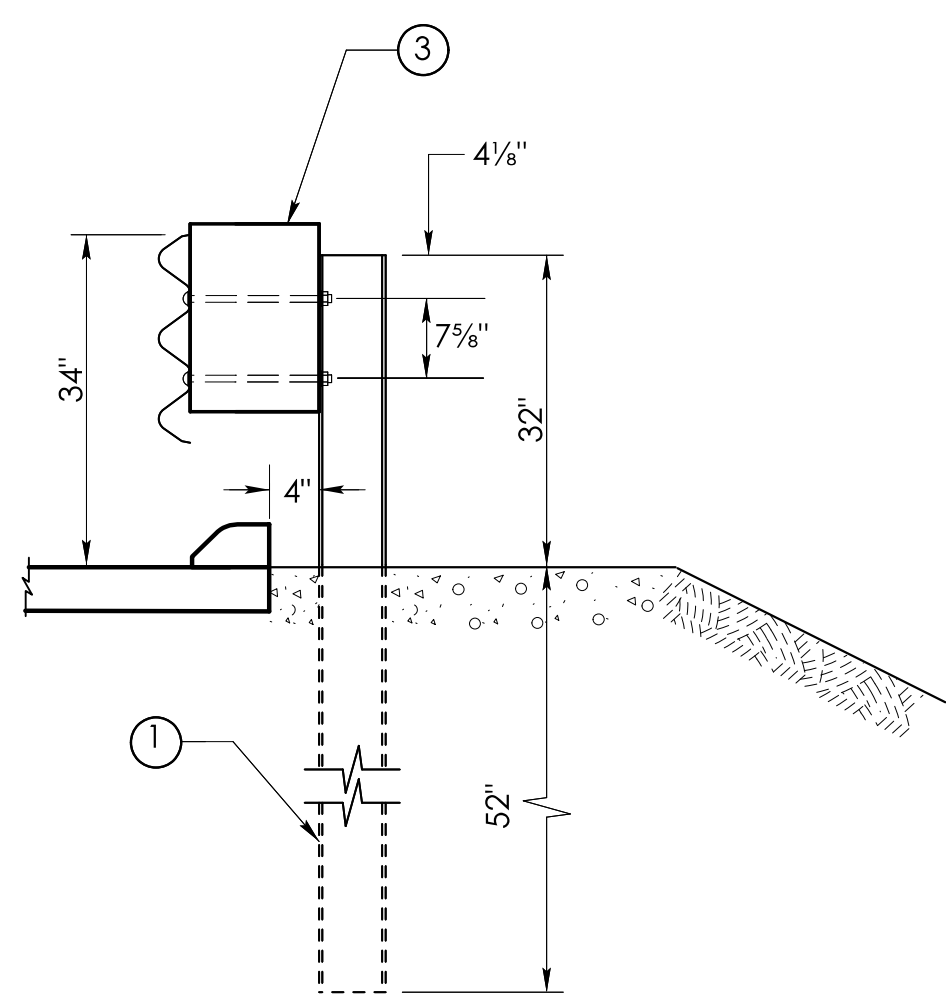
PLAN



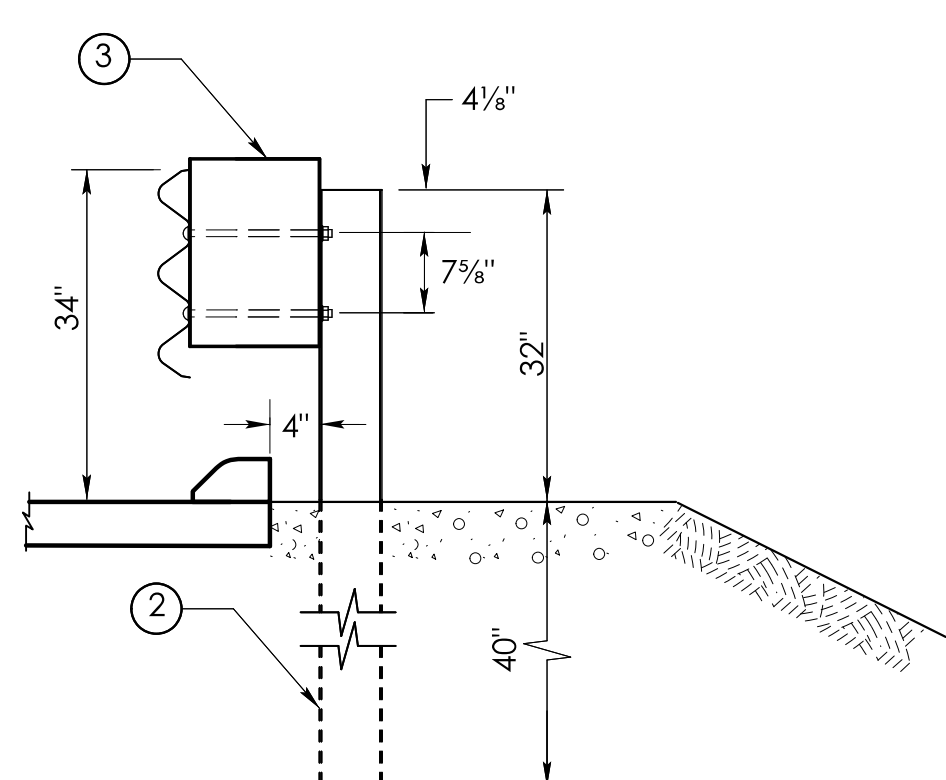
ELEVATION



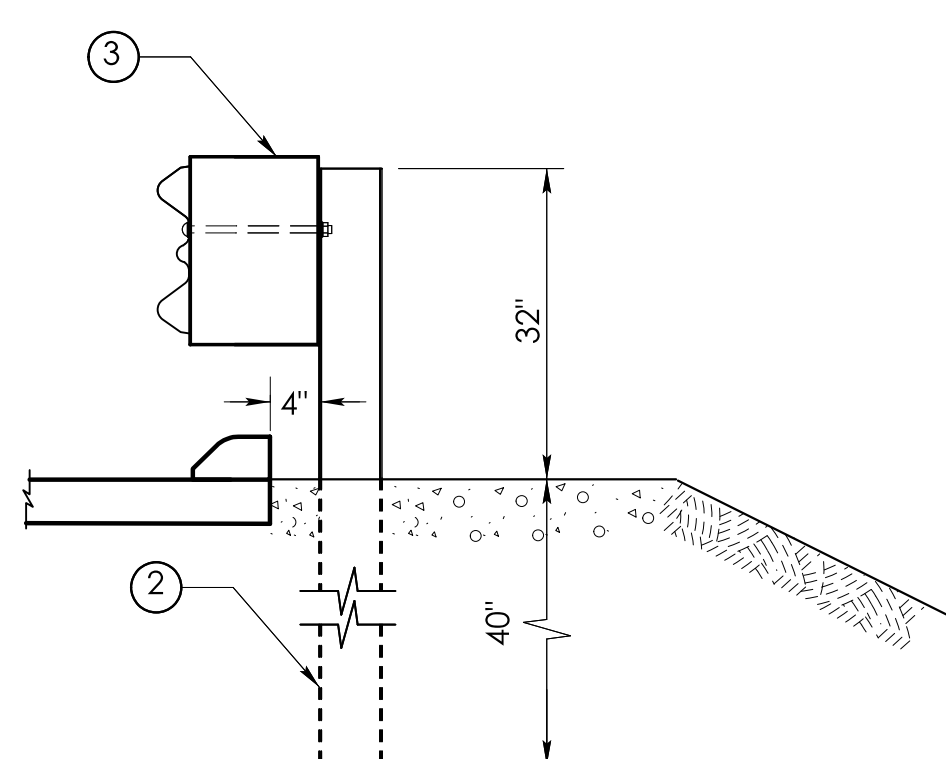
THRIE BEAM CONNECTION



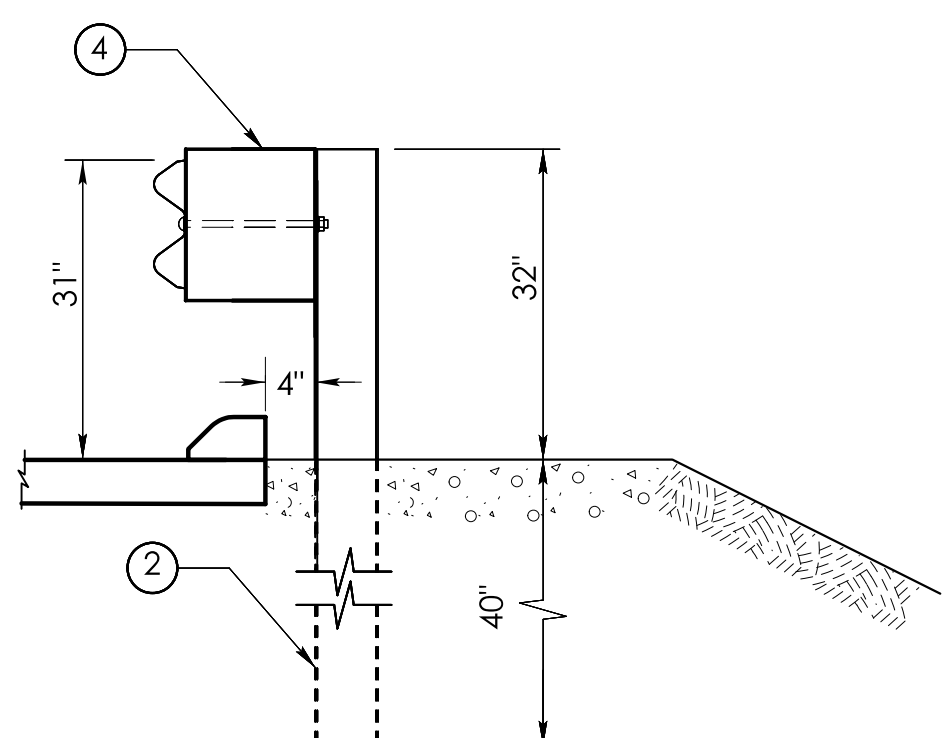
POST 1, 2 & 3



POST 4, 5, 6, 7 & 8



POST 9



POST 10, 11 & 12

LEGEND

- ① W6 x 15, 7 FOOT LONG STEEL POST
- ② W6 x 8.5 OR W6 x 9, 6 FOOT LONG STEEL POST
- ③ 6" x 12" x 19" TREATED TIMBER BLOCKOUT
- ④ 6" x 12" x 14 1/4" TREATED TIMBER BLOCKOUT

NOT TO SCALE

SIGNATURE BLOCK:  
OFFICE OF ENGINEERING  
2800 BERLIN TURNPIKE  
NEWINGTON, CT 06111

SUBMITTED BY:  
Digitally signed by  
Ligo Fontaine, P.E.  
Date: 2024.12.19  
15:06:03-05'00'

APPROVED BY:  
Digitally signed by  
Michael N.  
Calabrese, P.E.  
Date: 2025.01.29  
12:37:54-05'00'



CONNECTICUT  
DEPARTMENT OF  
TRANSPORTATION

CTDOT  
STANDARD SHEET

STANDARD SHEET TITLE:

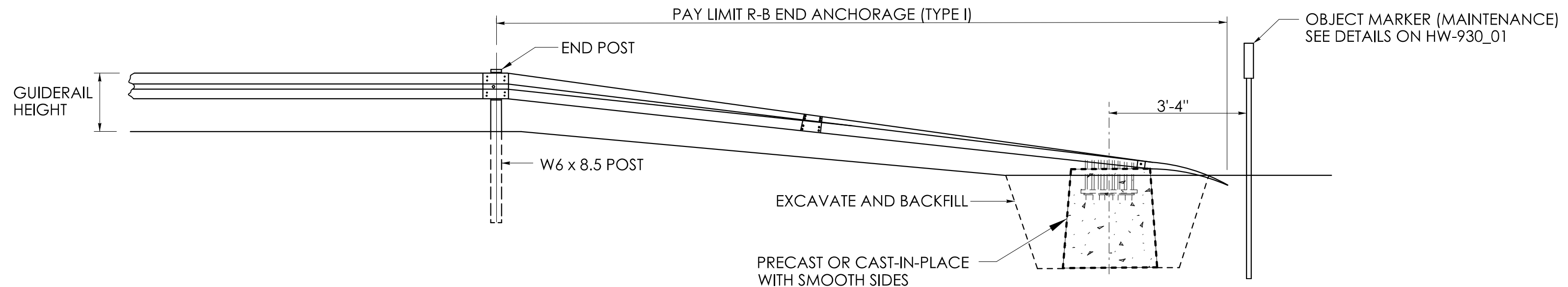
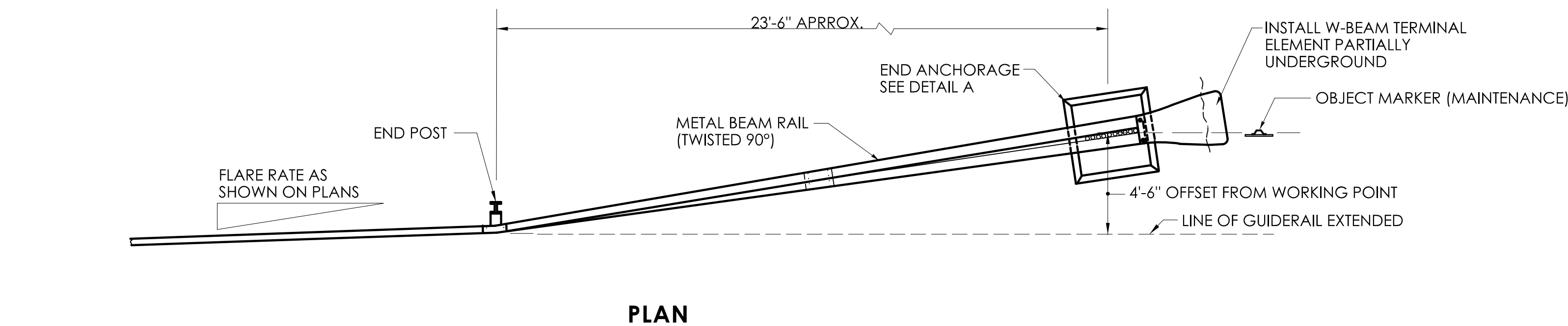
THRIE-BEAM ATTACHMENT

MASH 2016 COMPLIANT  
APPROVAL ID. 2019-01

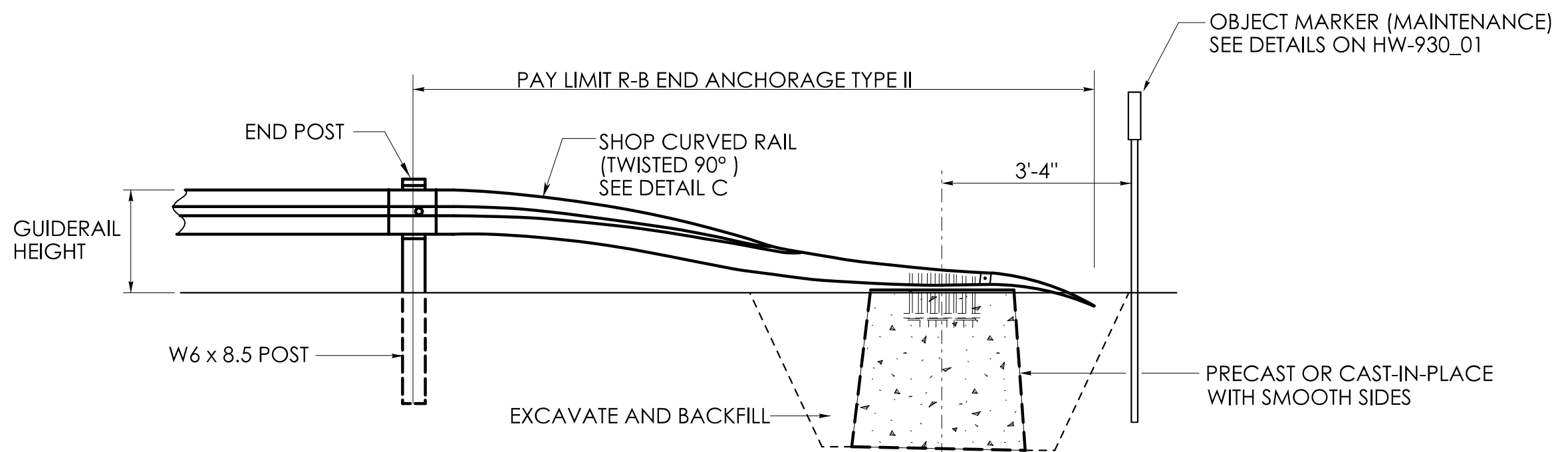
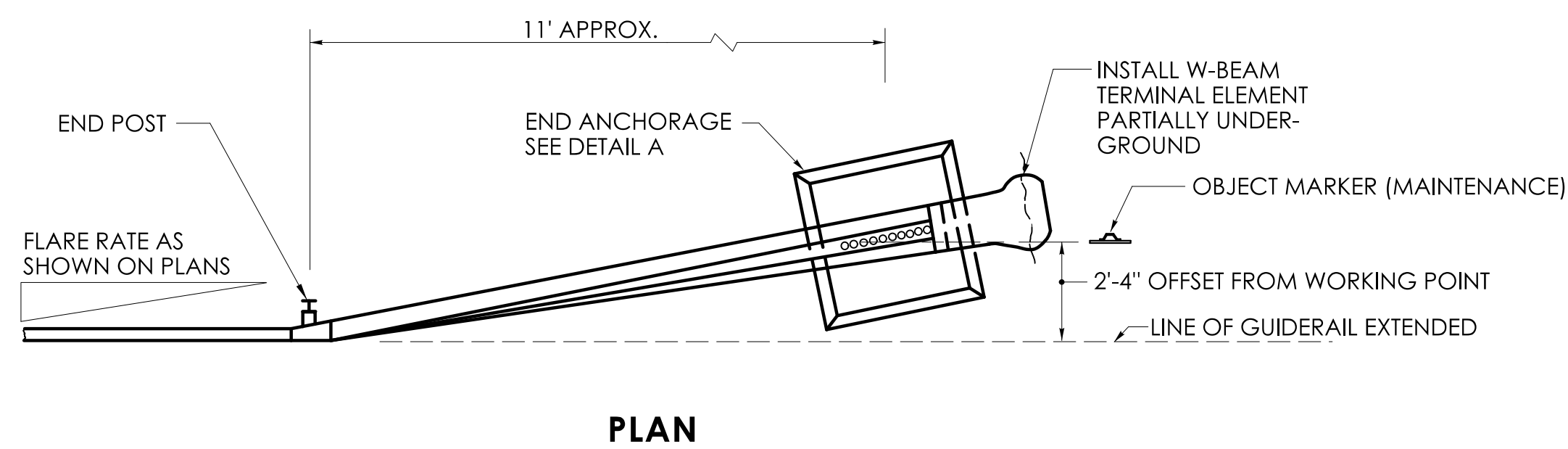
STANDARD SHEET NO.:

HW-910\_27

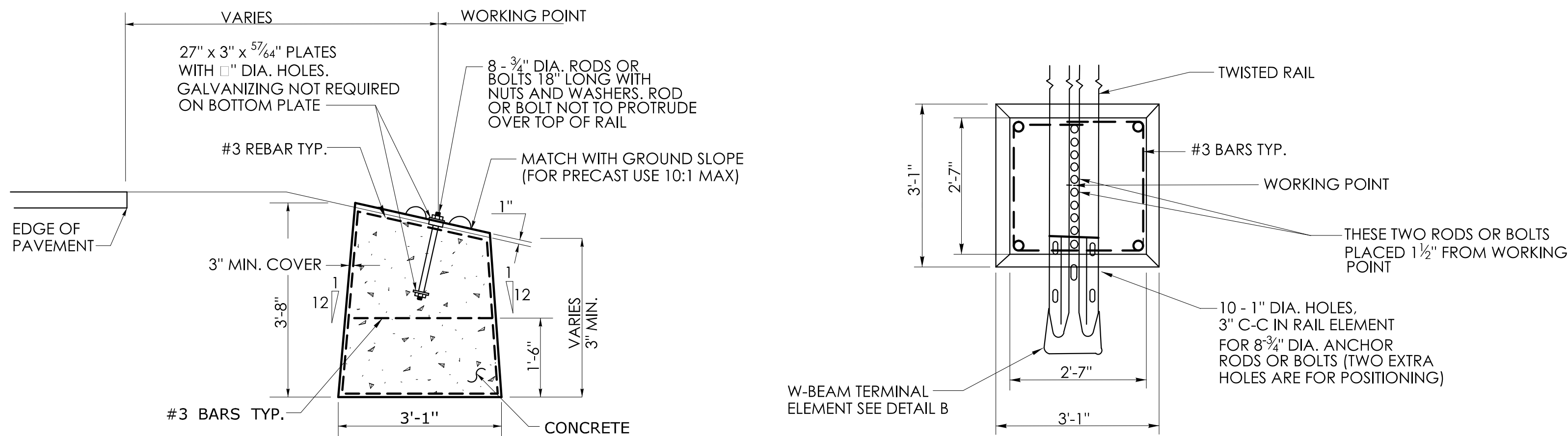
- GENERAL NOTES:**
- J-HOOK BOLTS MAY BE SUBSTITUTED FOR BOTTOM PLATE ANCHORAGE IN CONCRETE END ANCHORS USING THE SAME SIZE, STRENGTH, AND LENGTH AS NOTED ON THE PLANS.
  - INSTALLATION OF RADII DIFFERENT THAN WHAT IS SHOWN IN DETAIL "C" FOR R-B END ANCHORAGE TYPE II MUST BE APPROVED BY THE ENGINEER.



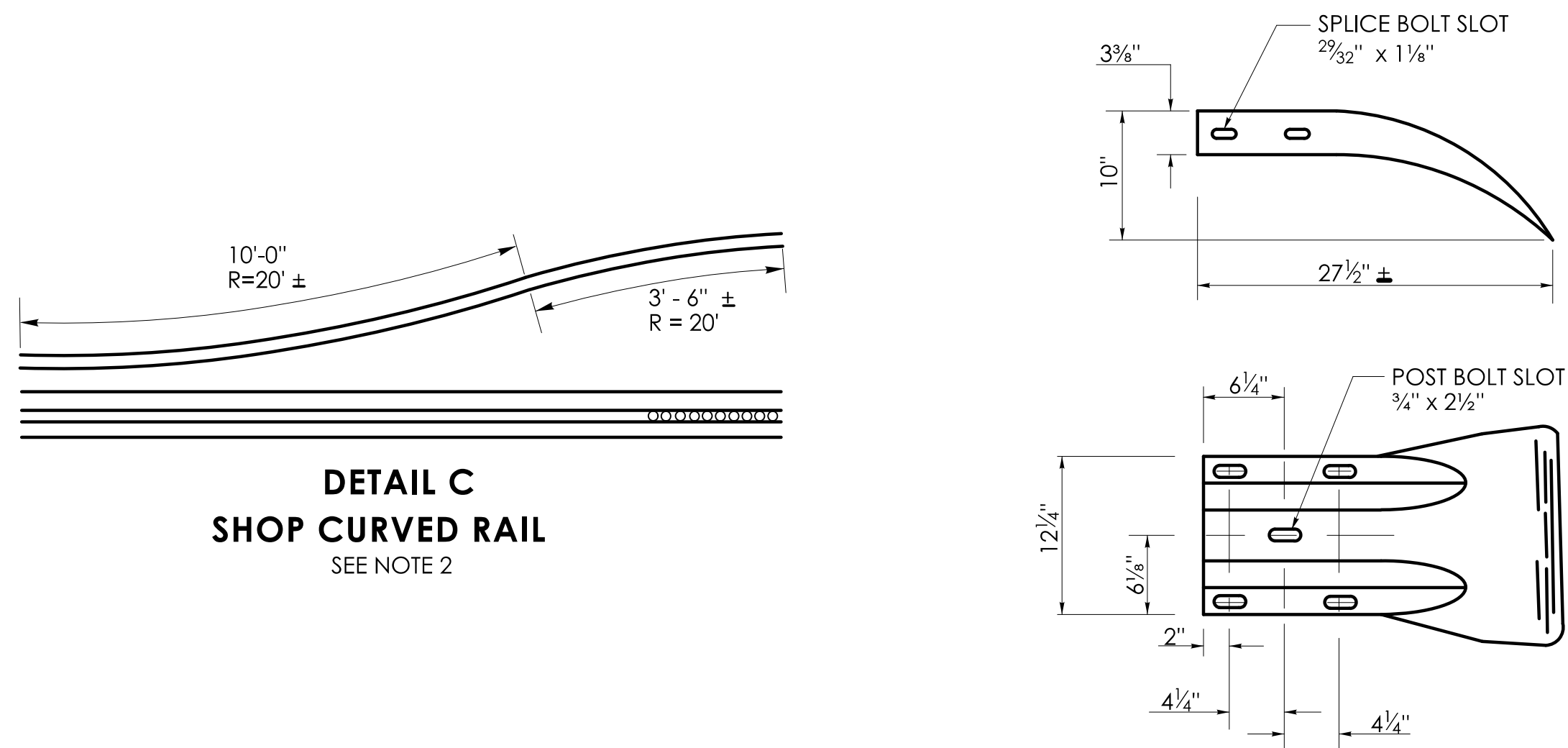
**R-B END ANCHORAGE TYPE I**



**R-B END ANCHORAGE TYPE II**

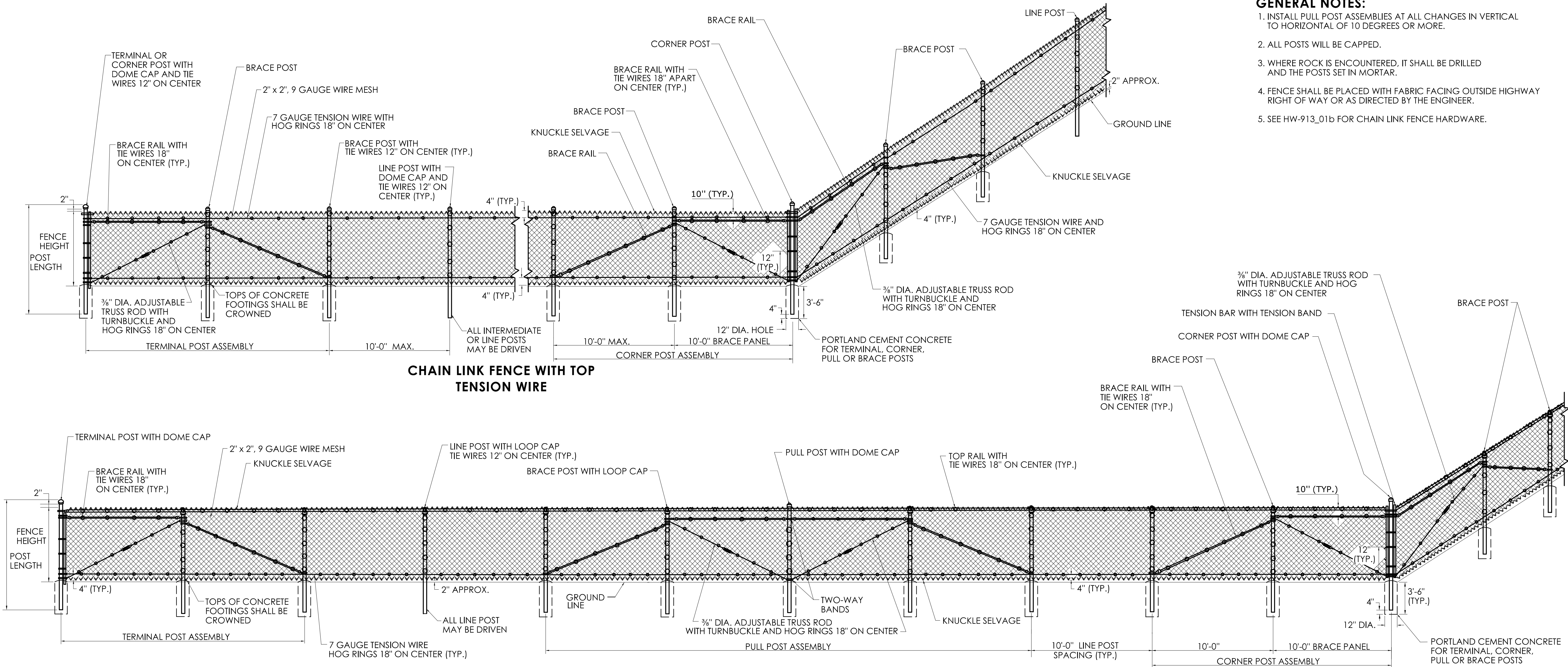


**DETAIL A  
ROADSIDE CONCRETE END ANCHOR**  
SEE NOTE 2

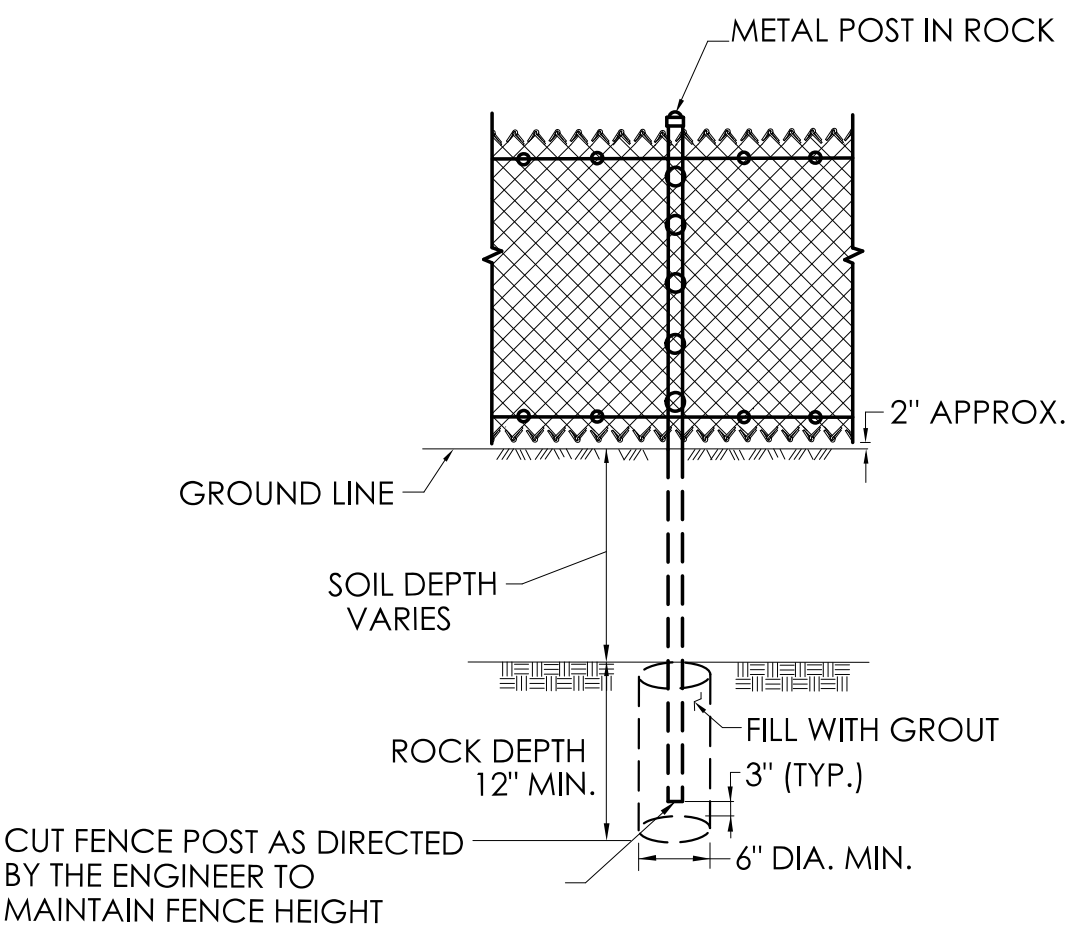




- GENERAL NOTES:**
1. INSTALL PULL POST ASSEMBLIES AT ALL CHANGES IN VERTICAL TO HORIZONTAL OF 10 DEGREES OR MORE.
  2. ALL POSTS WILL BE CAPPED.
  3. WHERE ROCK IS ENCOUNTERED, IT SHALL BE DRILLED AND THE POSTS SET IN MORTAR.
  4. FENCE SHALL BE PLACED WITH FABRIC FACING OUTSIDE HIGHWAY RIGHT OF WAY OR AS DIRECTED BY THE ENGINEER.
  5. SEE HW-913\_01b FOR CHAIN LINK FENCE HARDWARE.



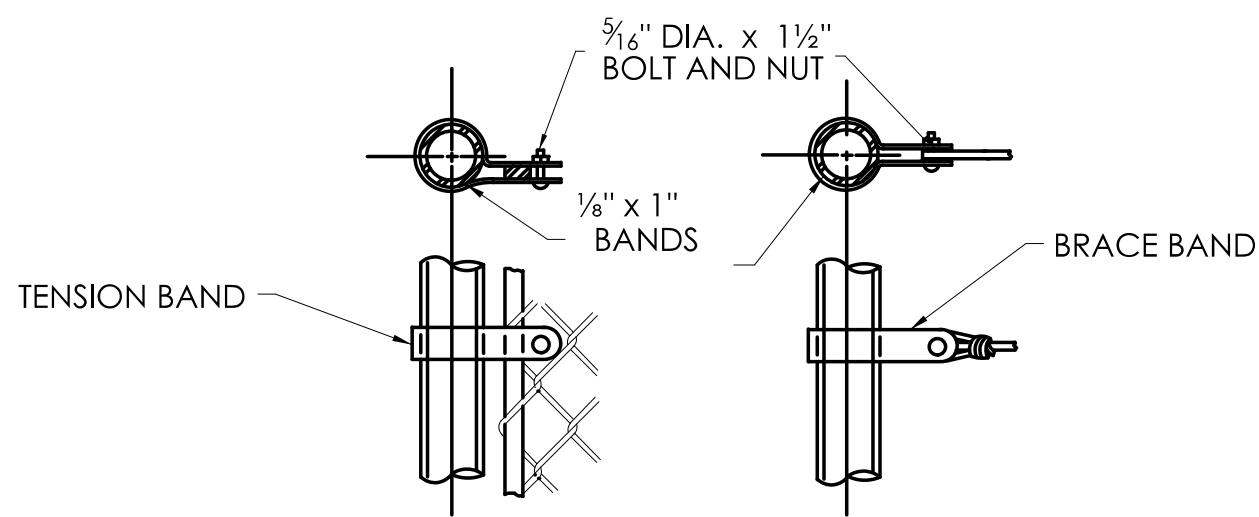
**CHAIN LINK FENCE WITH TOP BRACE RAIL AND INTERMEDIATE OR BOTTOM TENSION WIRE**



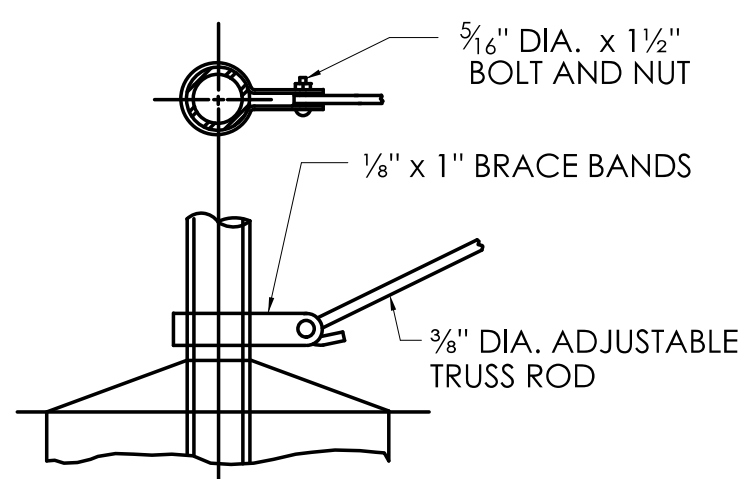
**METAL POST IN ROCK**

FENCE FABRIC HEIGHT	GROUP 1A ASTM F1083 SCH. 40 PIPE 50,000 PSI DIAMETER	GROUP 1C ASTM F1043 ELEC. RESISTANCE WELDED PIPE 50,000 PSI DIAMETER
LINE OR INTERMEDIATE POST		
UP TO 5'-0"	1 <sup>7</sup> / <sub>8</sub> "	1 <sup>7</sup> / <sub>8</sub> "
6'-0" TO 7'-0"	2 <sup>3</sup> / <sub>8</sub> "	2 <sup>3</sup> / <sub>8</sub> "
8'-0" TO 9'-0"	2 <sup>7</sup> / <sub>8</sub> "	2 <sup>7</sup> / <sub>8</sub> "
10'-0"	3 <sup>1</sup> / <sub>2</sub> "	3 <sup>1</sup> / <sub>2</sub> "
12'-0" OR HIGHER	4"	4"
TERMINAL, CORNER OR PULL POST		
UP TO 5'-0"	2 <sup>3</sup> / <sub>8</sub> "	2 <sup>3</sup> / <sub>8</sub> "
6'-0" TO 7'-0"	2 <sup>7</sup> / <sub>8</sub> "	2 <sup>7</sup> / <sub>8</sub> "
8'-0" TO 9'-0"	3 <sup>1</sup> / <sub>2</sub> "	3 <sup>1</sup> / <sub>2</sub> "
10'-0" OR HIGHER	4"	4"
TOP OR BRACE RAIL POSTS UP TO 6'-0"	1 <sup>5</sup> / <sub>8</sub> "	1 <sup>5</sup> / <sub>8</sub> "
POSTS HIGHER THAN 6'-0"	1 <sup>7</sup> / <sub>8</sub> "	1 <sup>7</sup> / <sub>8</sub> "

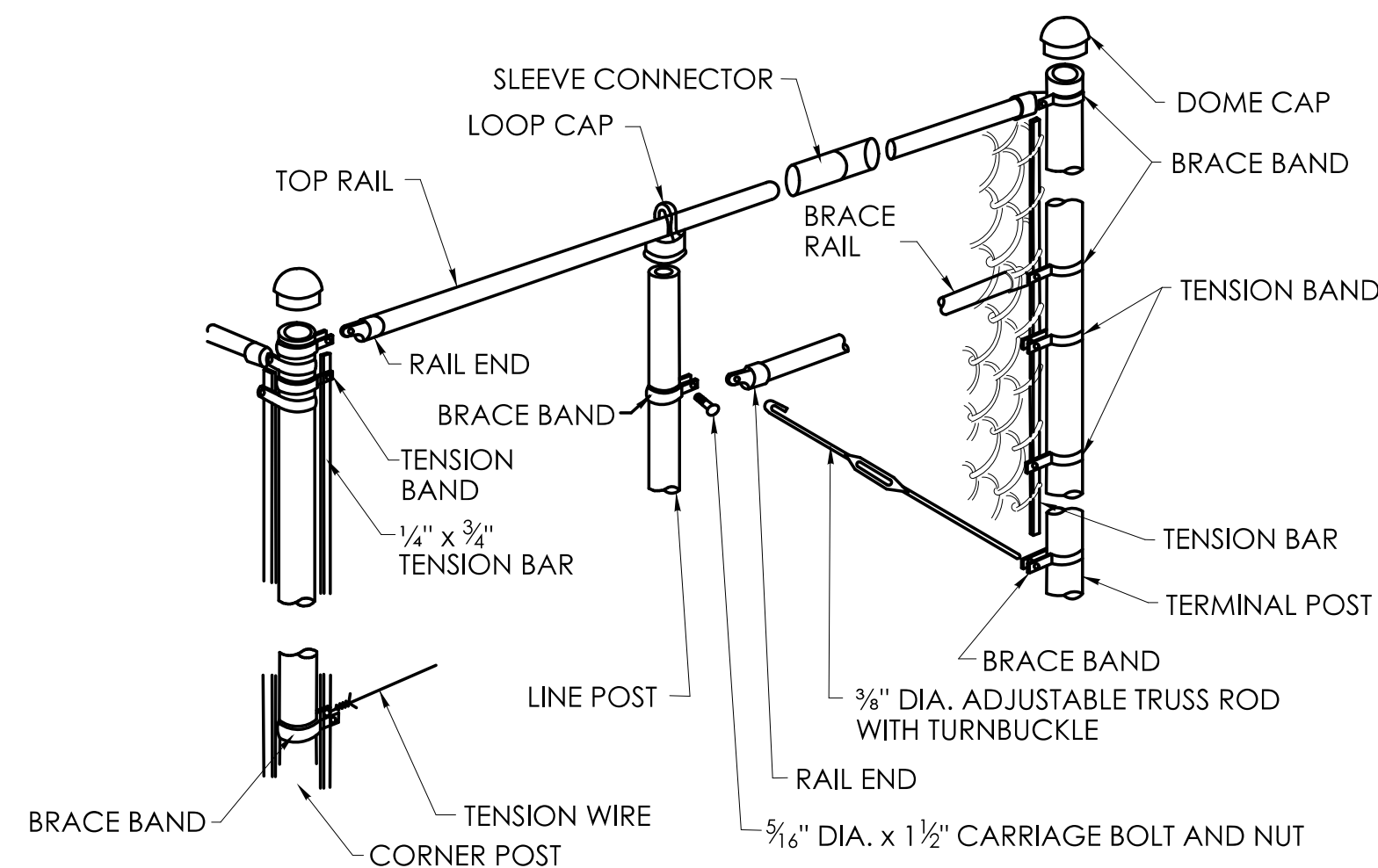




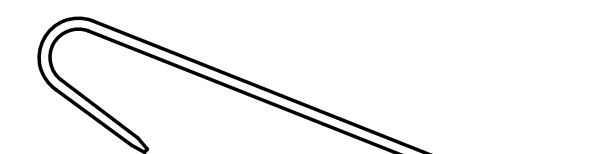
**TENSION BAR      TENSION WIRE**



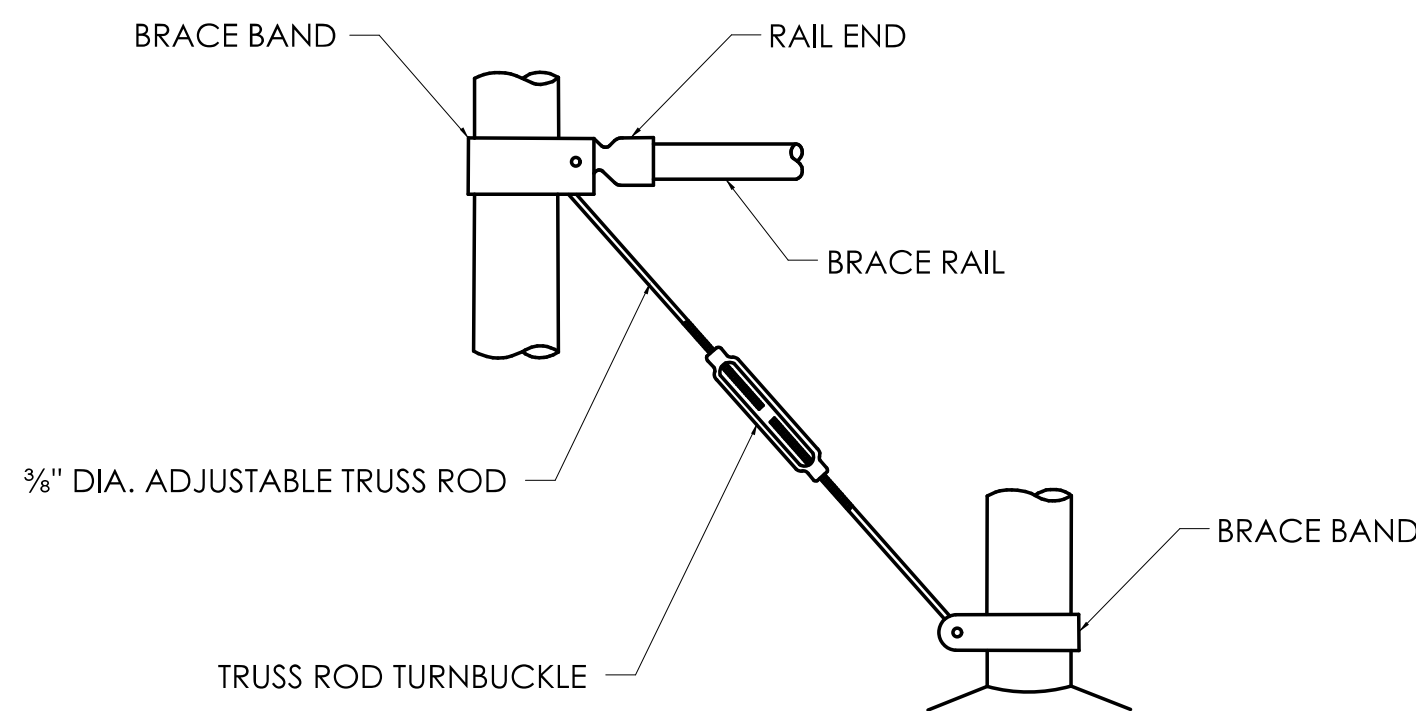
**ADJUSTABLE TRUSS ROD**



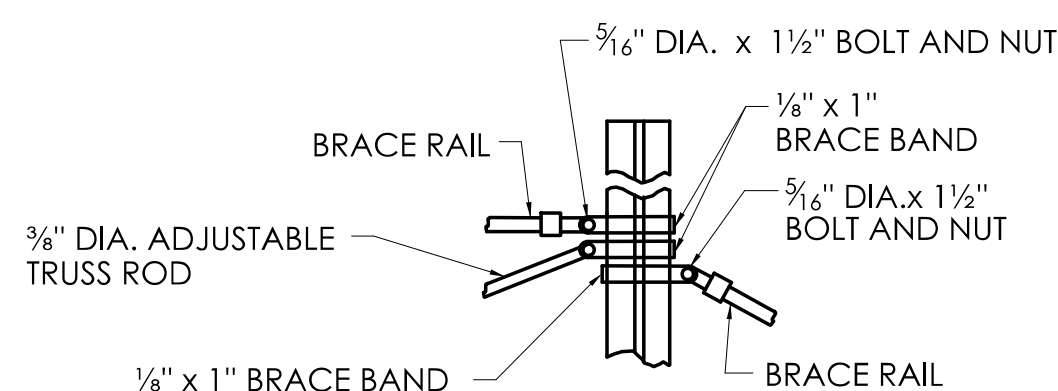
**TOP RAIL / TRUSSED BRACE RAIL  
WITH BOTTOM TENSION WIRE**



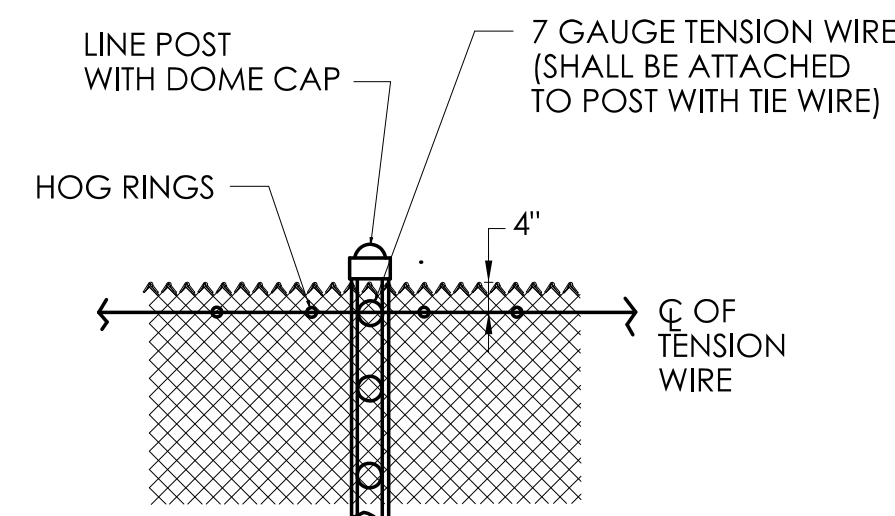
**TIE WIRE**



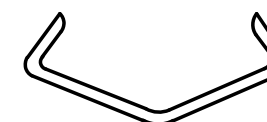
**BRACE & TRUSS CONNECTIONS**



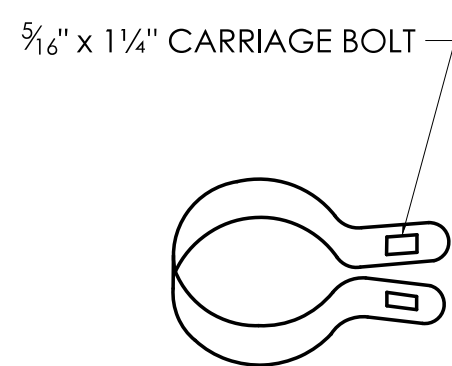
**BRACE RAILS ATTACHMENT  
TO LINE POSTS**



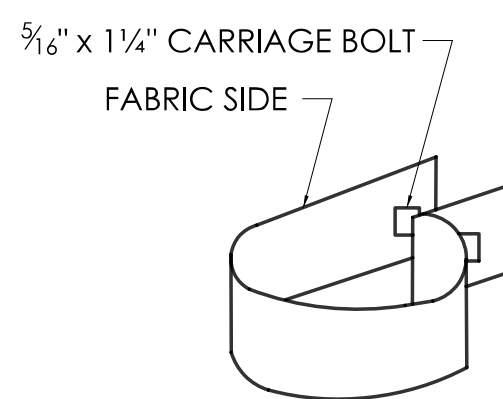
**TENSION WIRE**



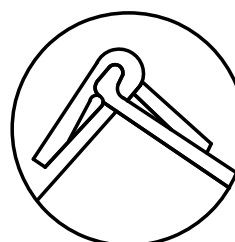
**HOG RING**



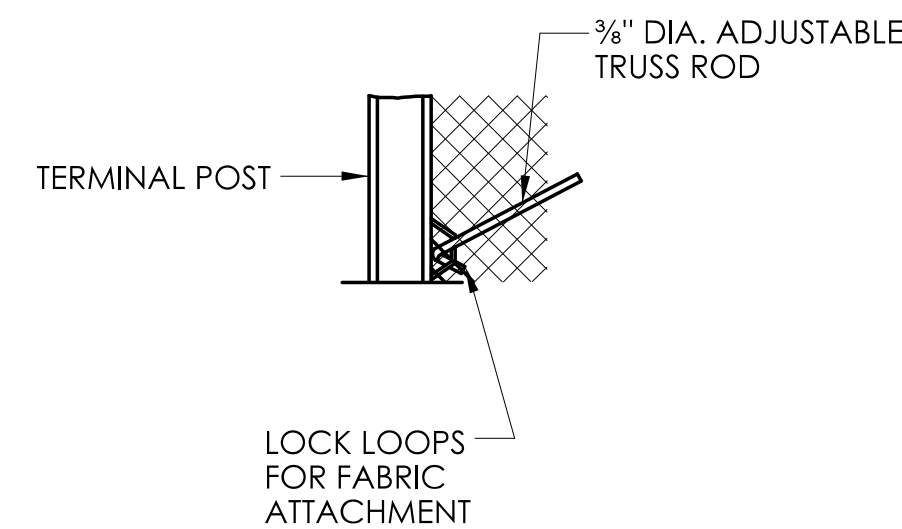
**1/8" x 1" BRACE BAND**



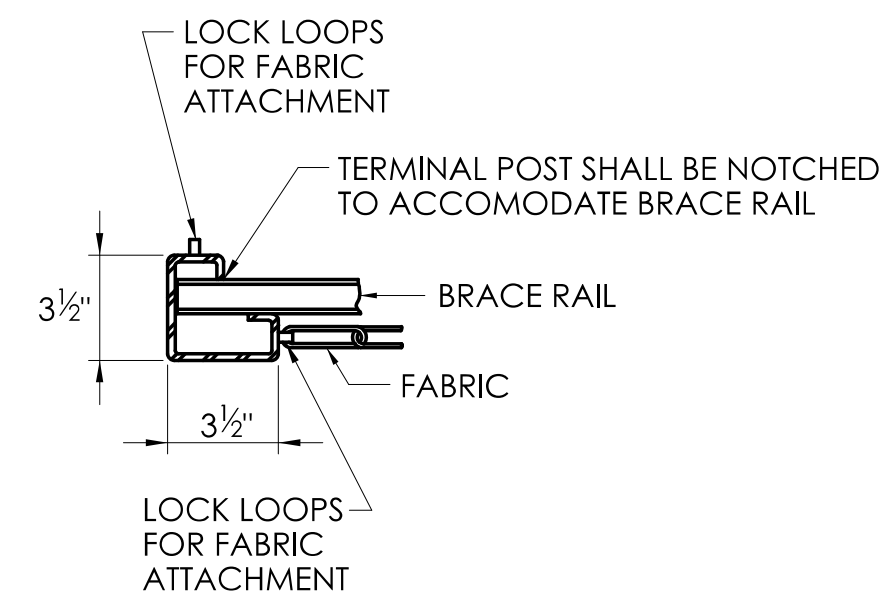
**1/8" x 1" TENSION BAND**



**KNUCKLE SELVAGE**



**TRUSS ROD  
ATTACHMENT**



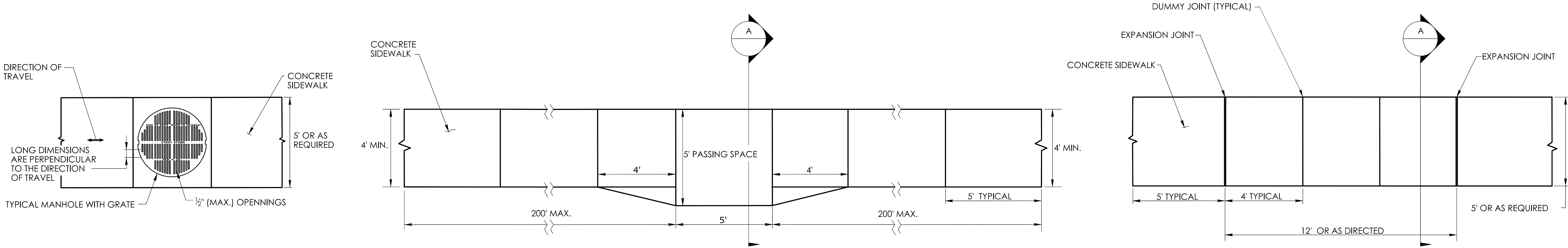
**FABRIC AND BRACE  
RAIL ATTACHMENT**



**GENERAL NOTES:**

1. SEE CONCRETE SIDEWALK RAMPS GUIDE SHEETS FOR PEDESTRIAN RAMP TYPES.

2. ALL CURBING SHALL BE INSTALLED AS EITHER PRECAST OR CAST IN PLACE AS DIRECTED.



**PEDESTRIAN ACCESS ROUTE  
OVER A MANHOLE WITH GRATE**

1. HORIZONTAL OPENINGS IN GRATES AND JOINTS MUST NOT BE MORE THAN 1/2 INCH
2. ELONGATED OPENINGS IN GRATES MUST BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DIRECTION OF TRAVEL

**5' PASSING SPACE FOR 4' WIDE SIDEWALK  
PLAN**

PASSING SPACES SHALL BE PROVIDED AT INTERVALS OF 200' MAXIMUM FOR SIDEWALKS LESS THAN 5' IN WIDTH

**5' WIDE SIDEWALK  
PLAN**

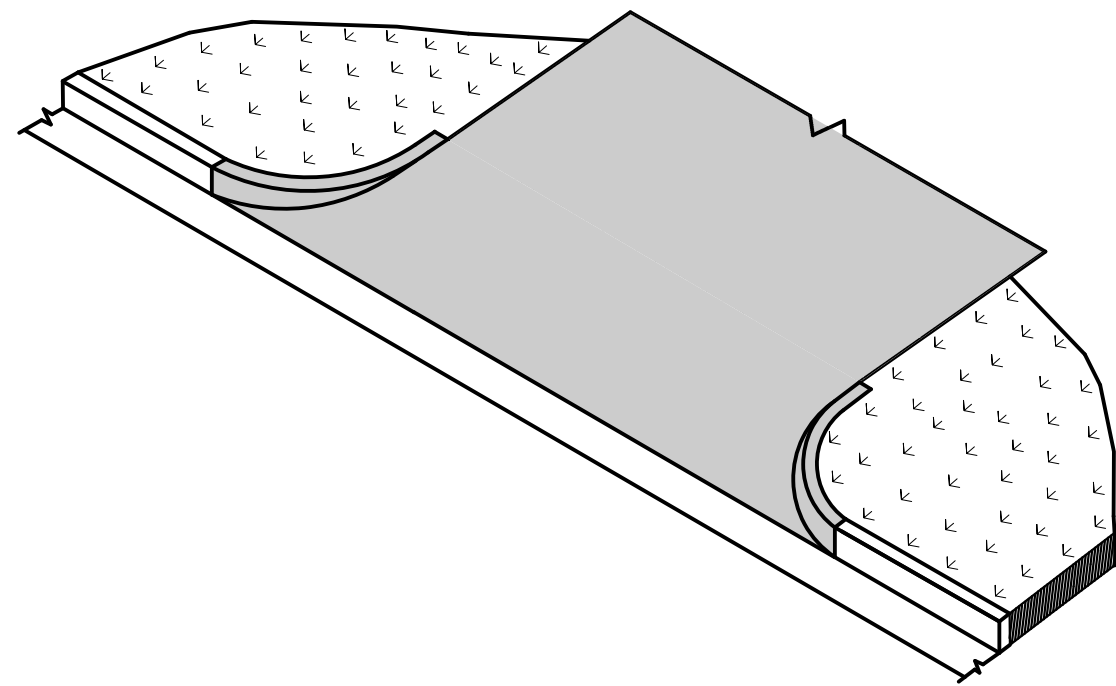


**VERTICAL SURFACE DISCONTINUITIES**

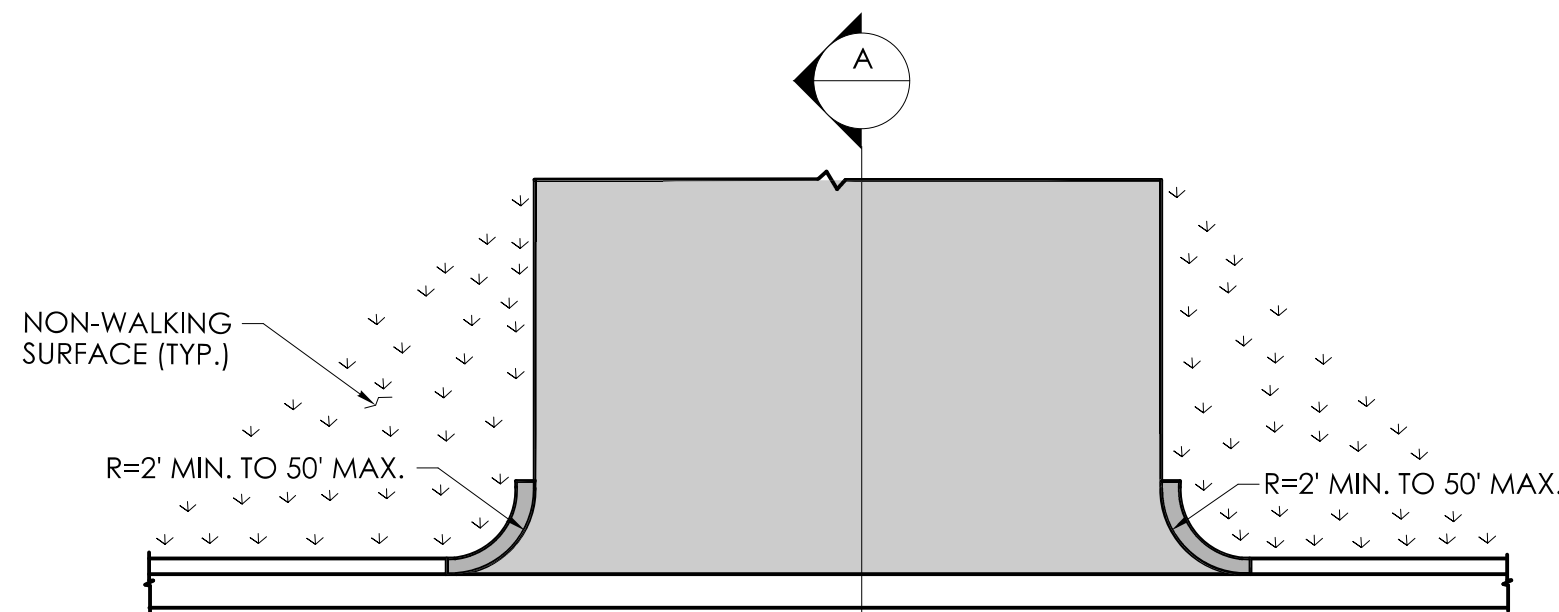
VERTICAL SURFACE DISCONTINUITIES MUST BE BEVELED TO A HEIGHT NOT GREATER THAN 1/4 INCH. THE BEVEL MUST BE THE ENTIRE WIDTH OF THE DISCONTINUITY

**5' PASSING SPACE FOR 4' WIDE SIDEWALK**

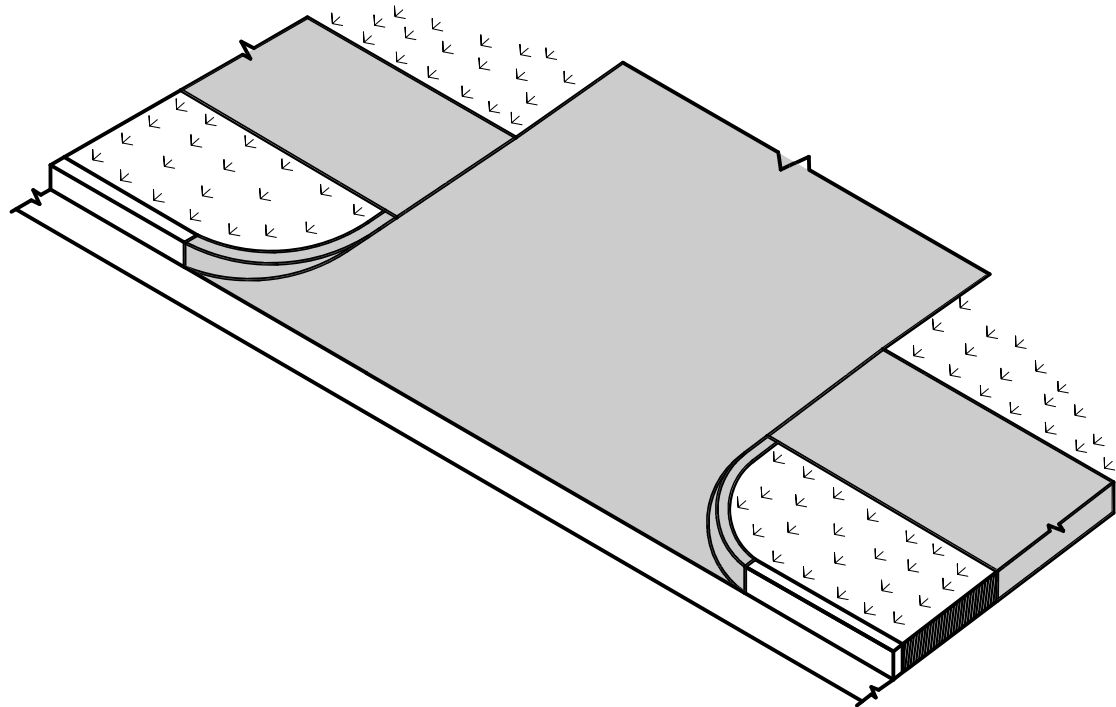
**SECTION A**



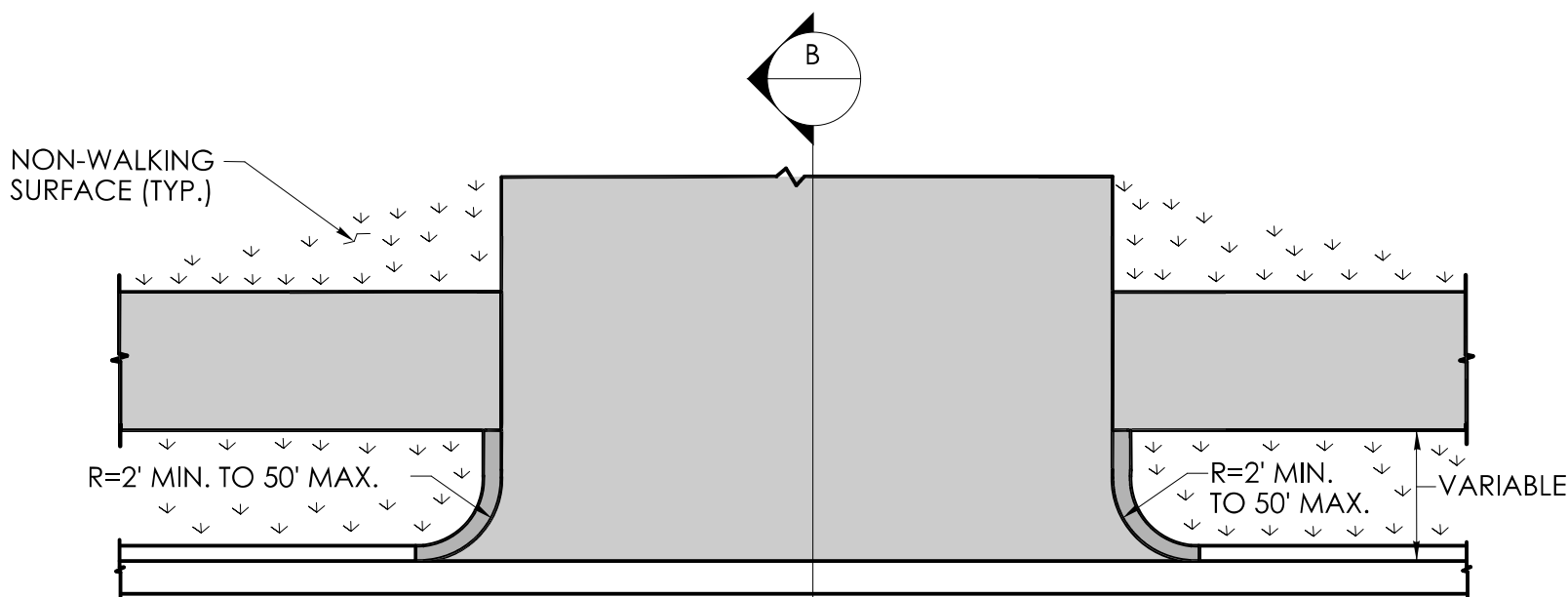
BITUMINOUS CONCRETE DRIVEWAY



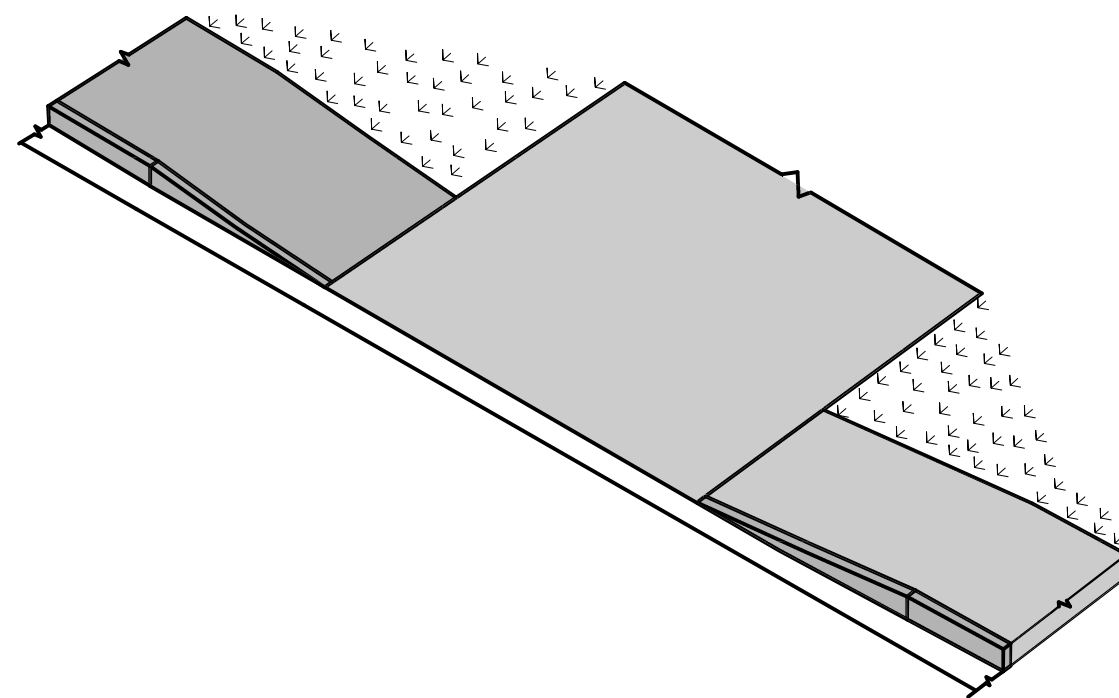
PLAN



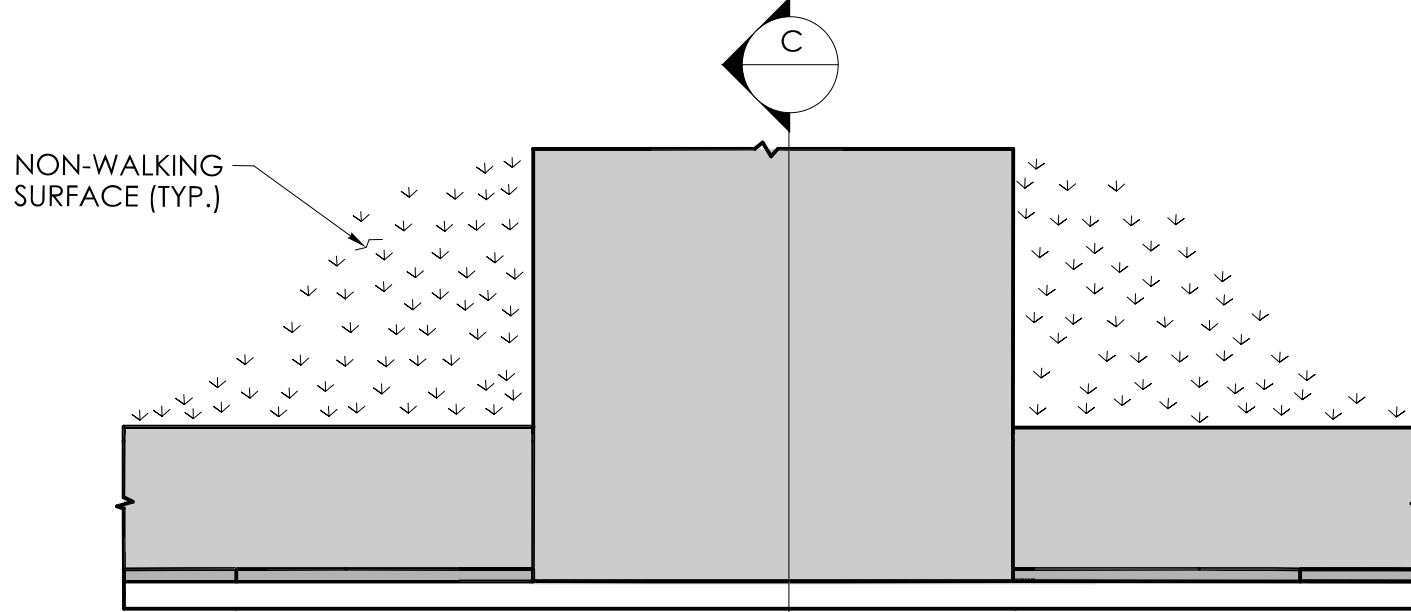
BITUMINOUS CONCRETE DRIVEWAY  
WITH A PEDESTRIAN SIDEWALK SETBACK



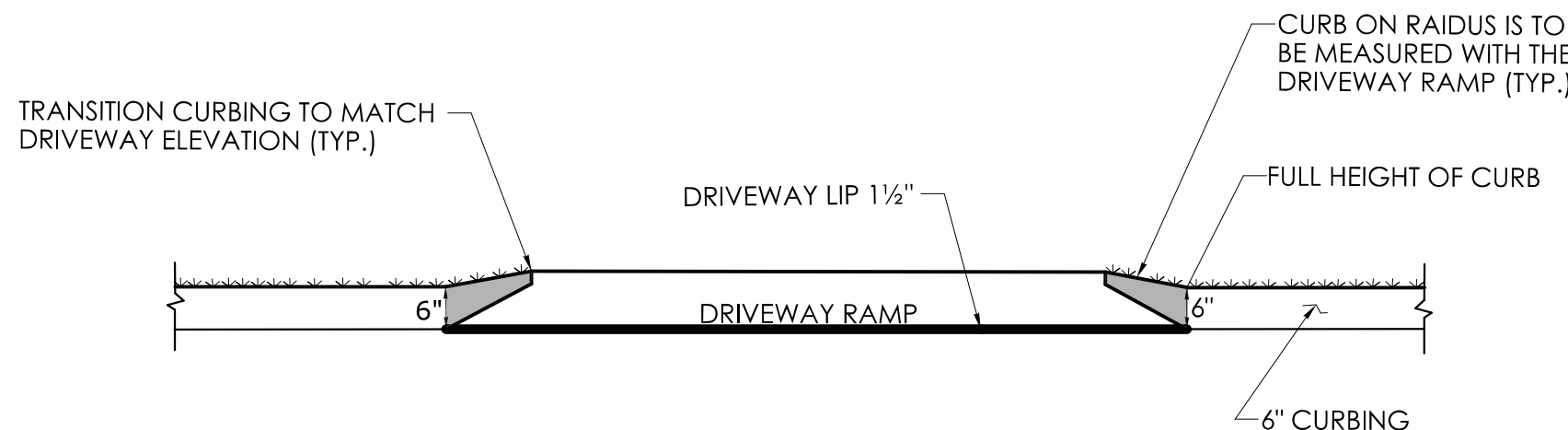
PLAN



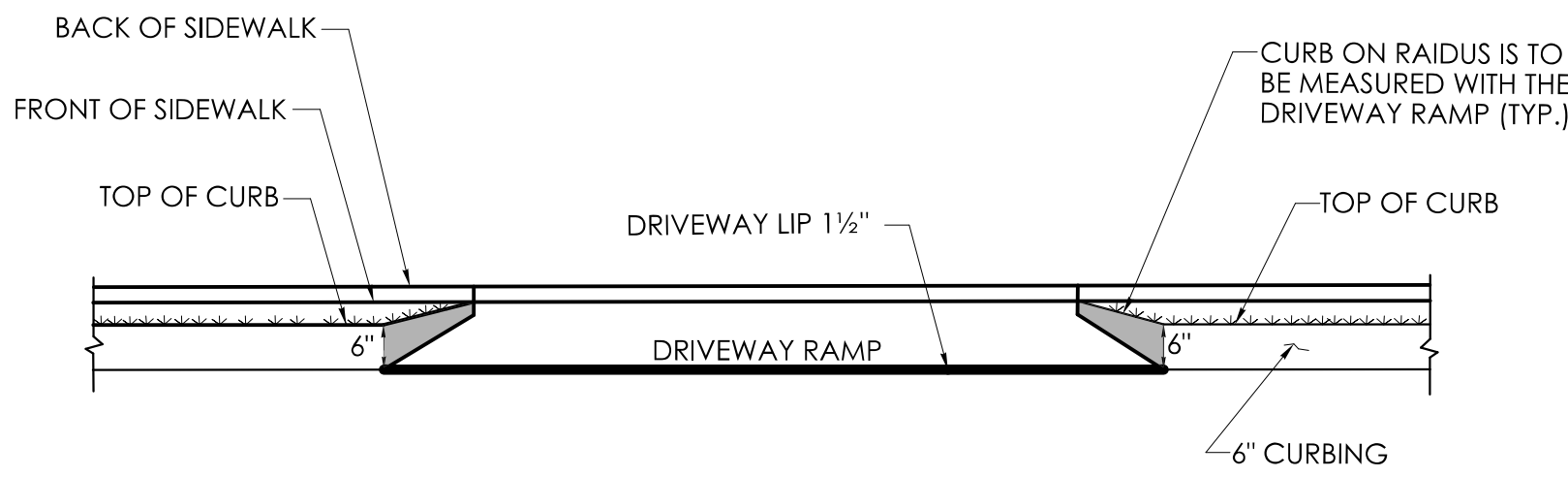
BITUMINOUS CONCRETE DRIVEWAY  
WITH PEDESTRIAN SIDEWALK AT THE CURB



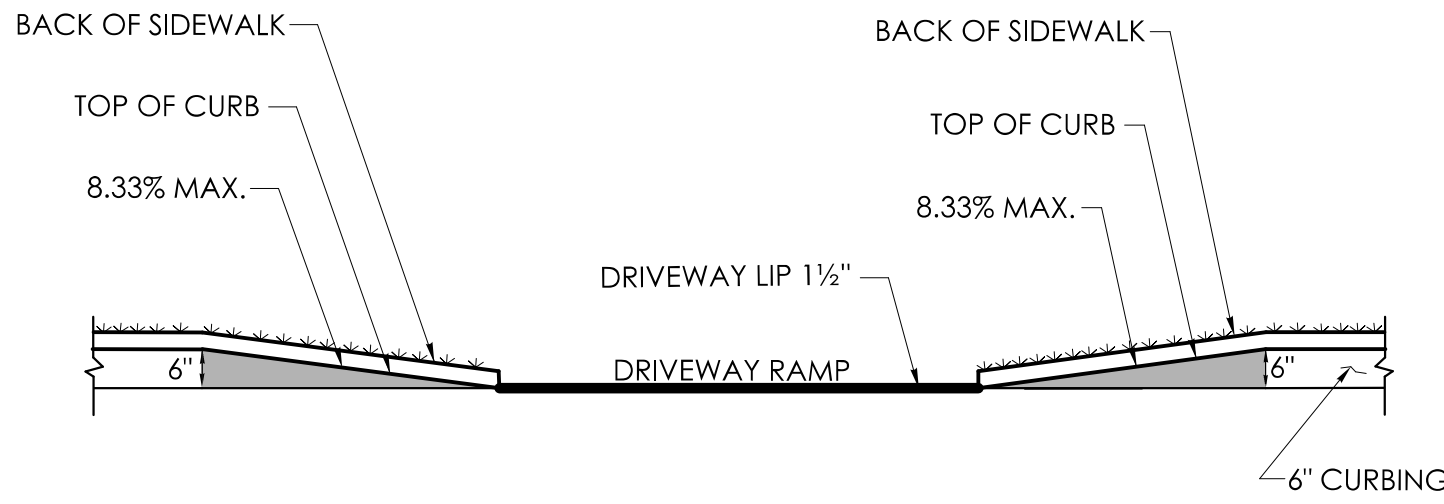
PLAN



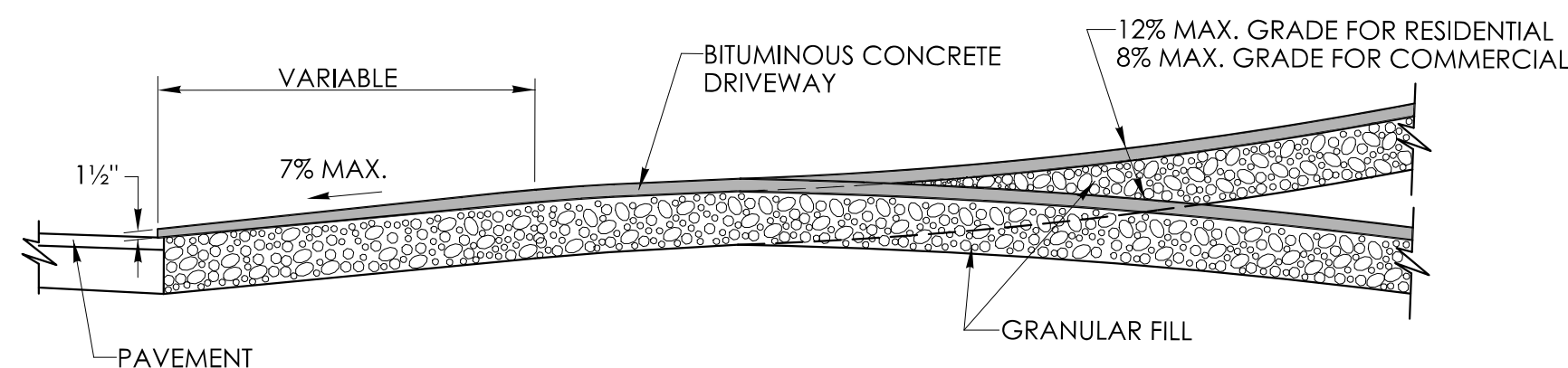
ELEVATION



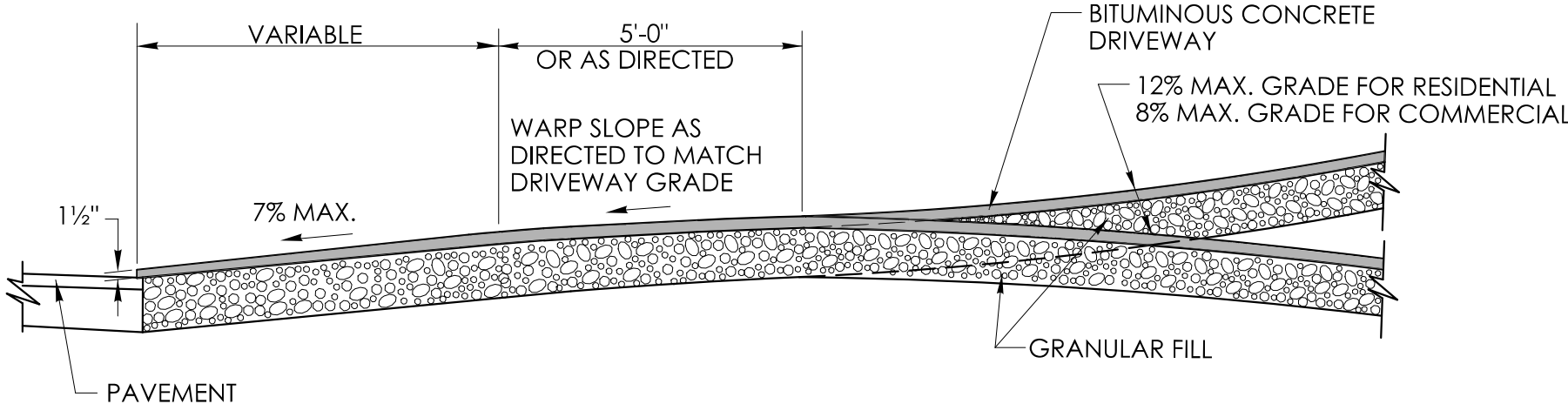
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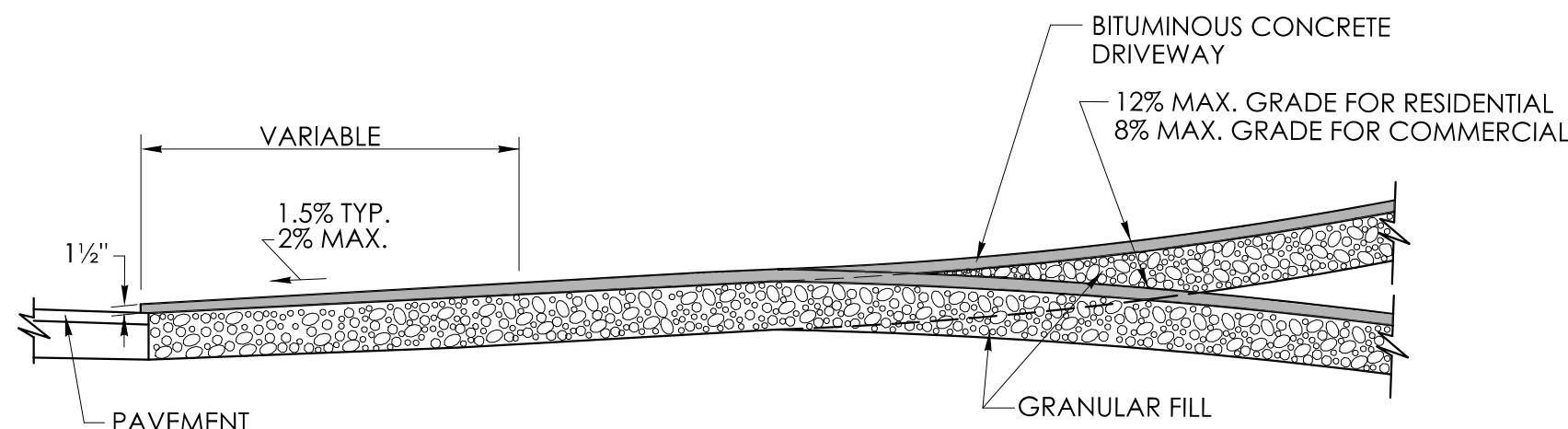
ELEVATION



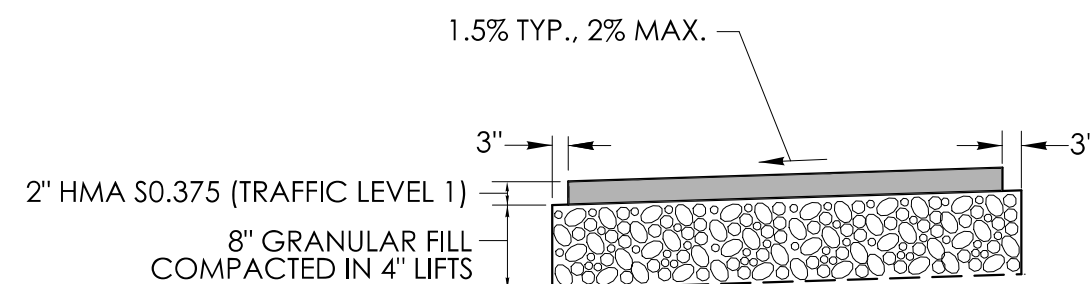
SECTION A



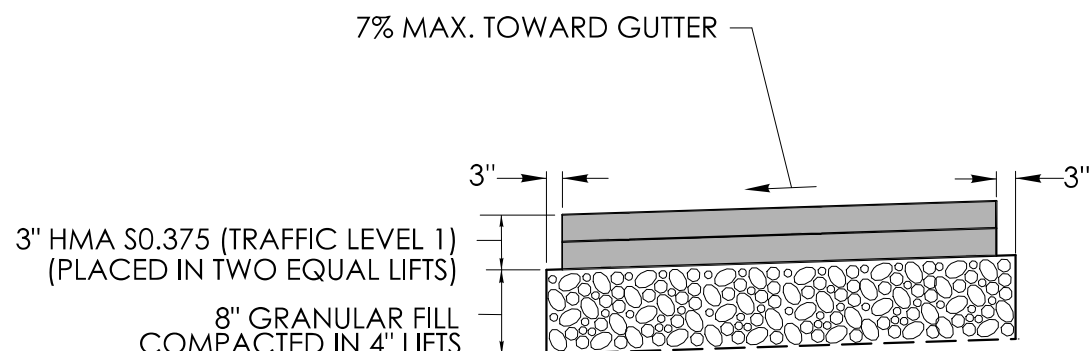
SECTION B



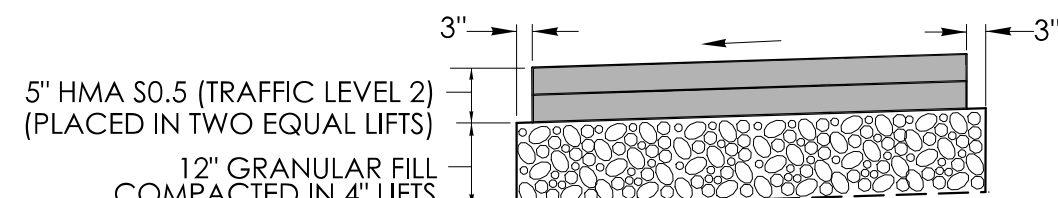
SECTION C



BITUMINOUS CONCRETE SIDEWALK

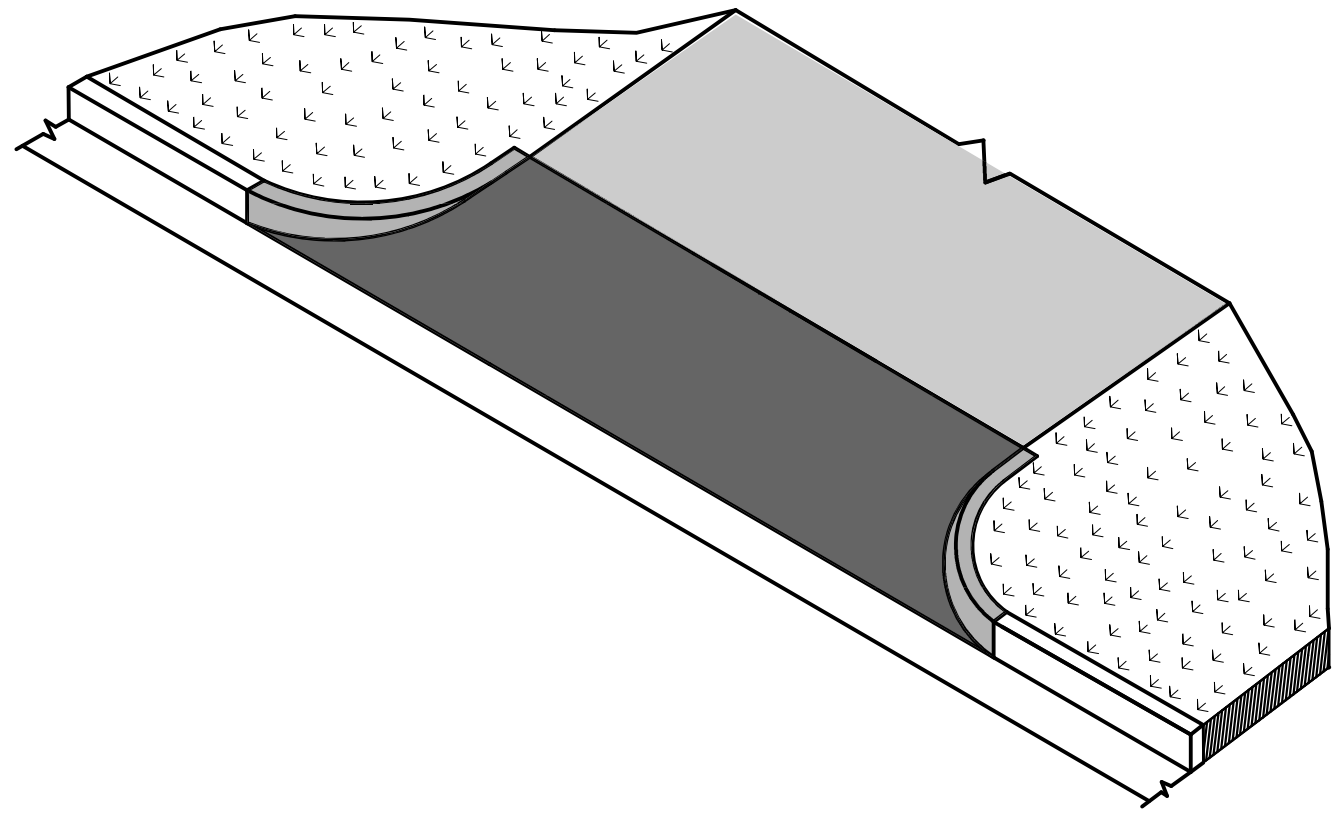


BITUMINOUS CONCRETE DRIVEWAY

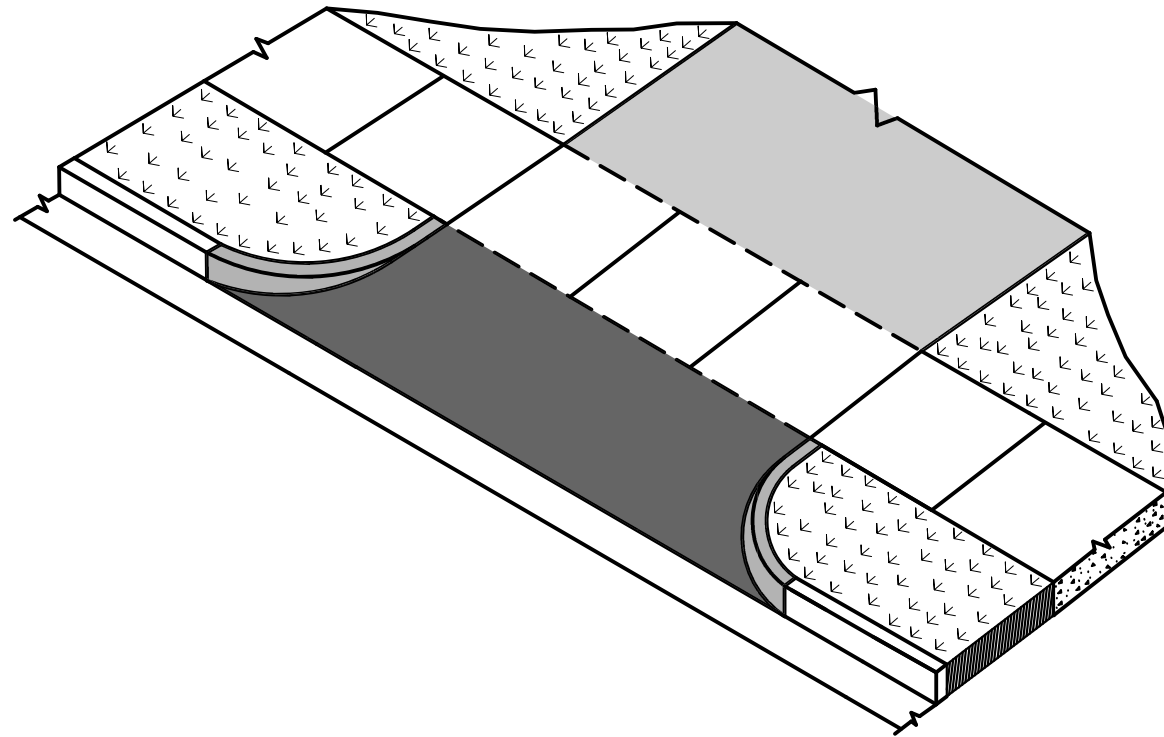


COMMERCIAL  
BITUMINOUS CONCRETE DRIVEWAY

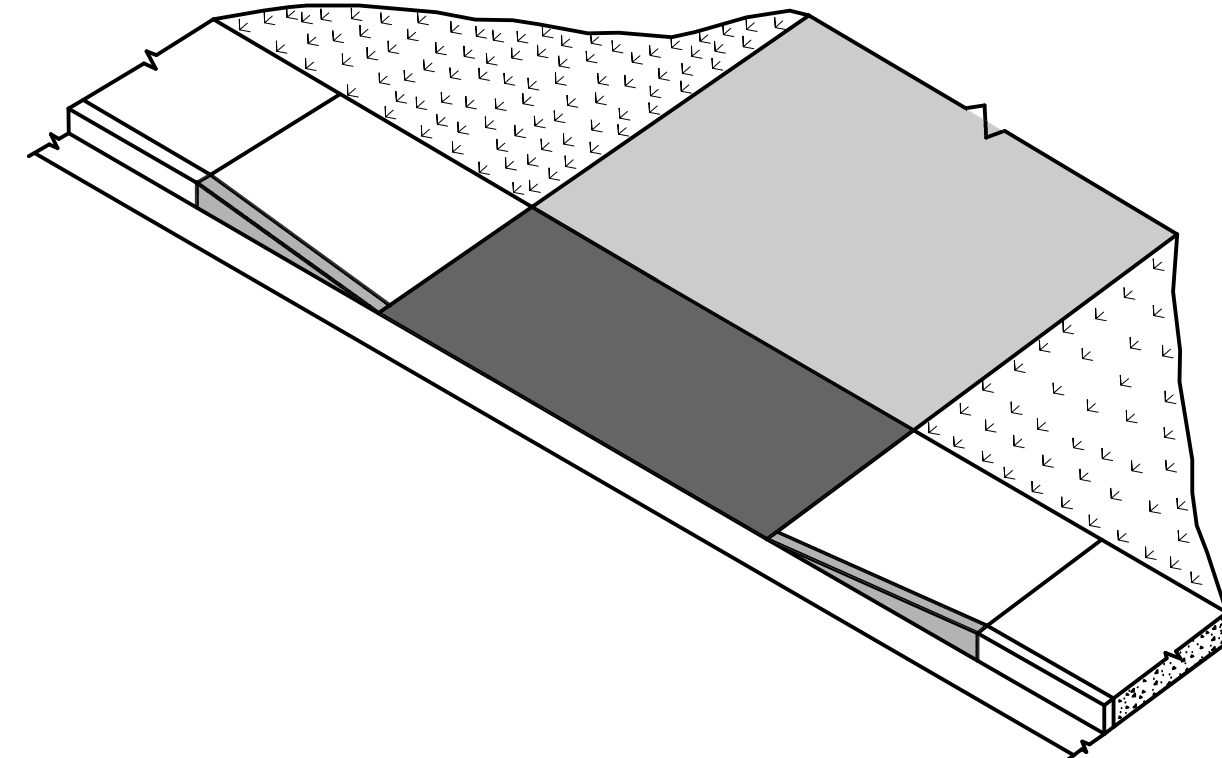




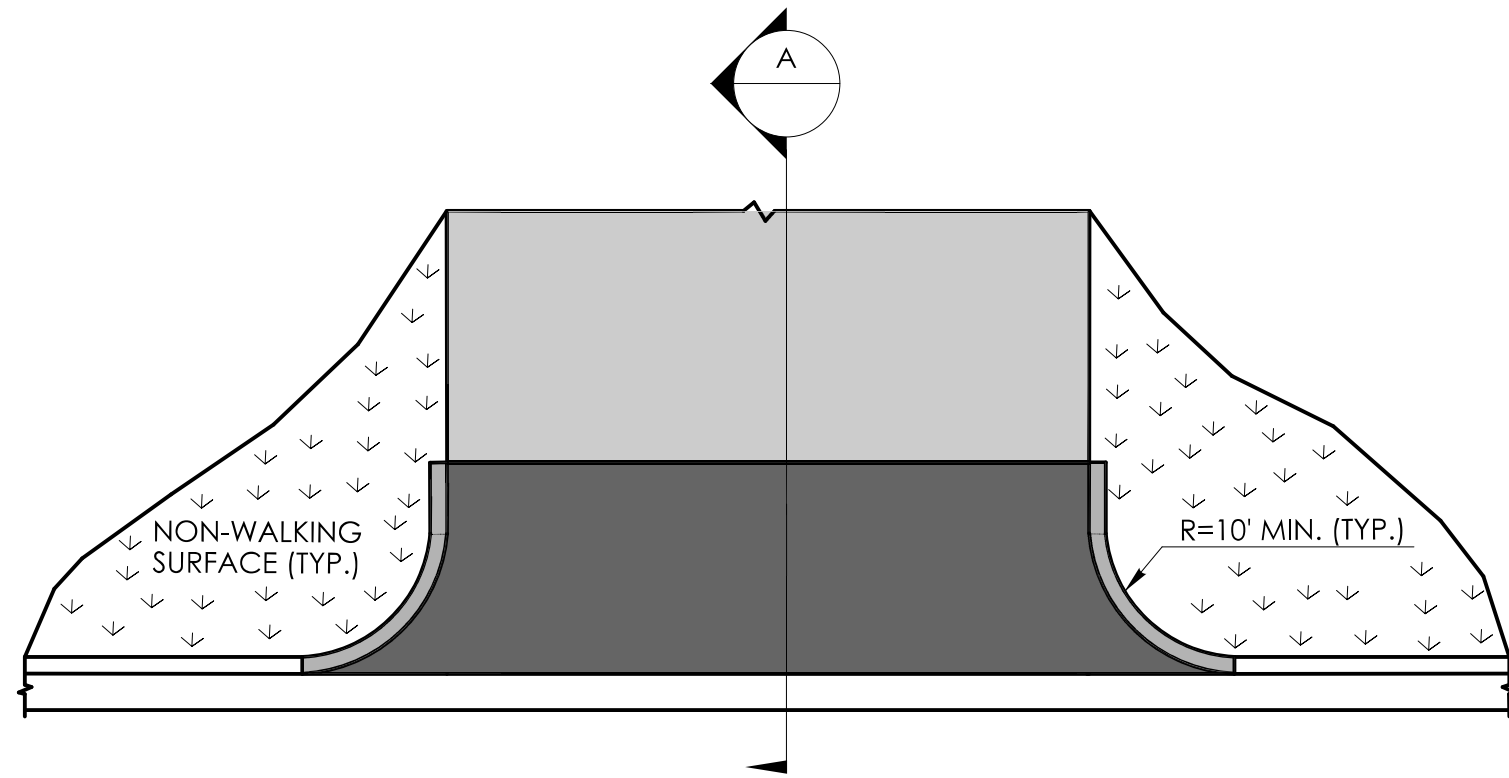
CONCRETE DRIVEWAY RAMP



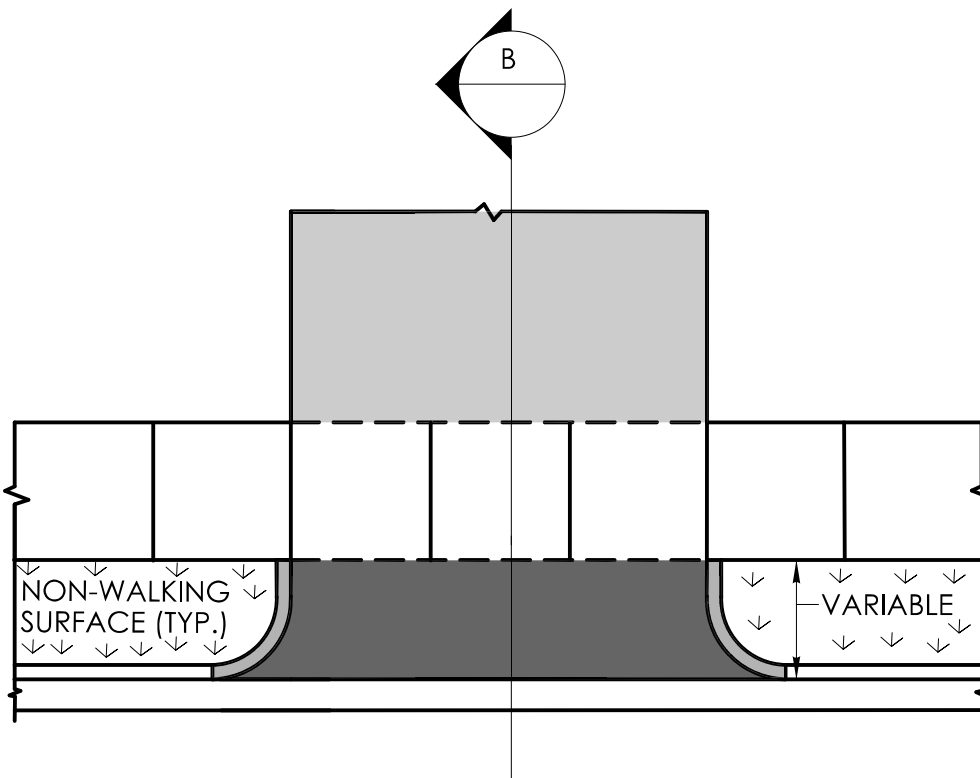
CONCRETE DRIVEWAY RAMP  
WITH A PEDESTRIAN SIDEWALK SETBACK



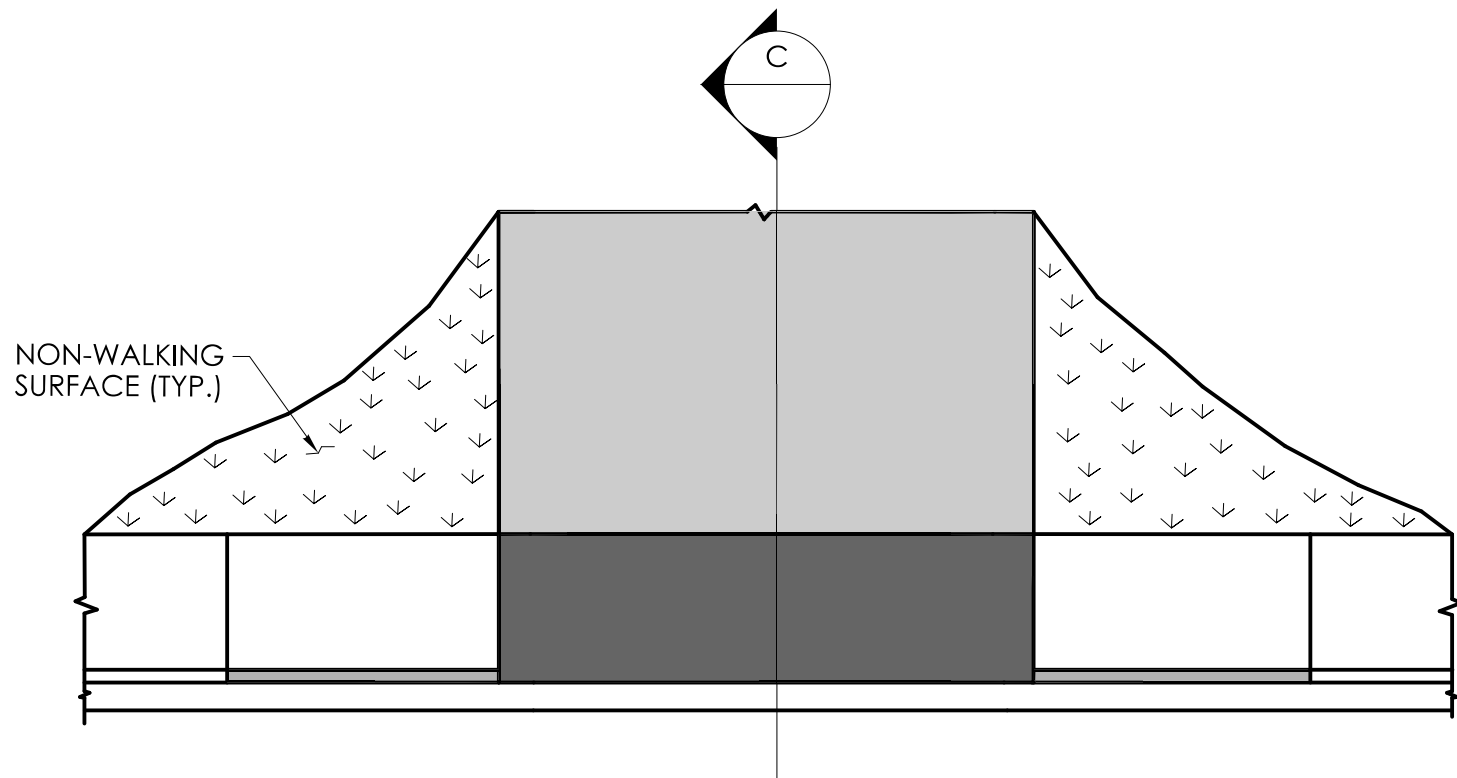
CONCRETE DRIVEWAY RAMP  
WITH PEDESTRIAN SIDEWALK AT THE CURB



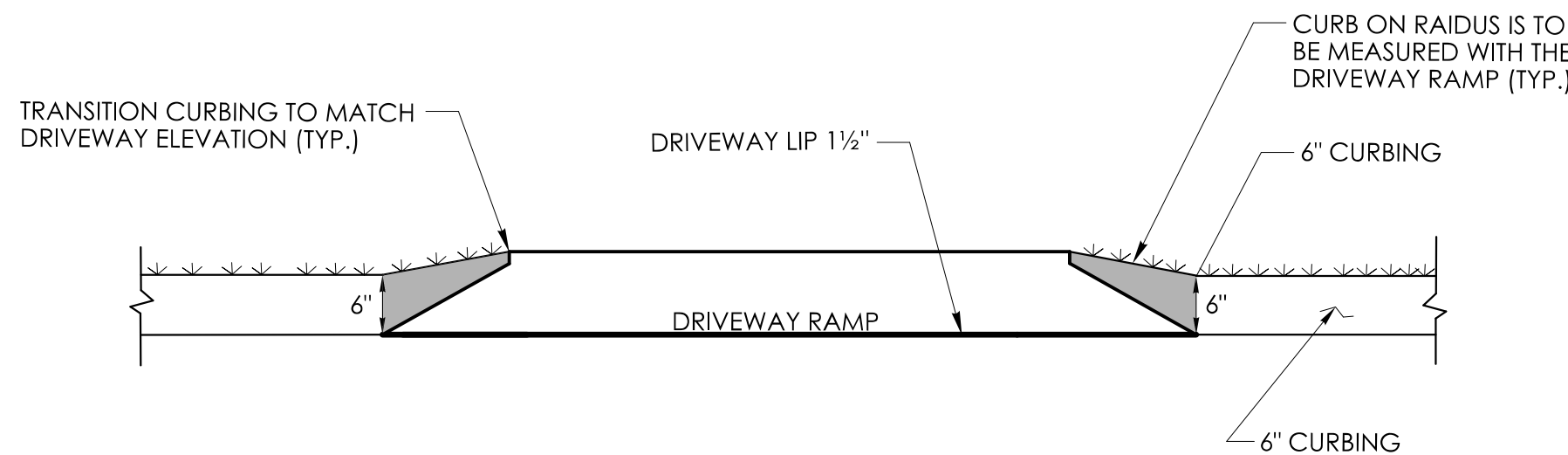
PLAN



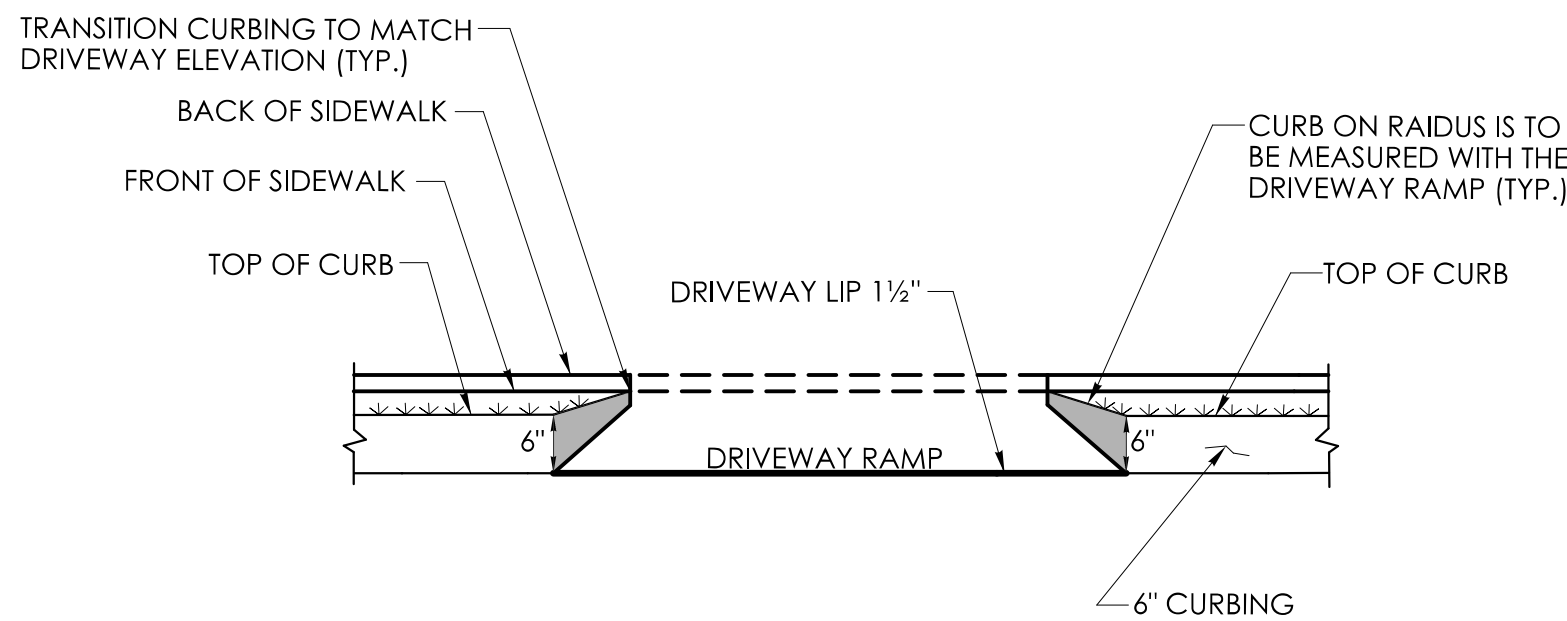
PLAN



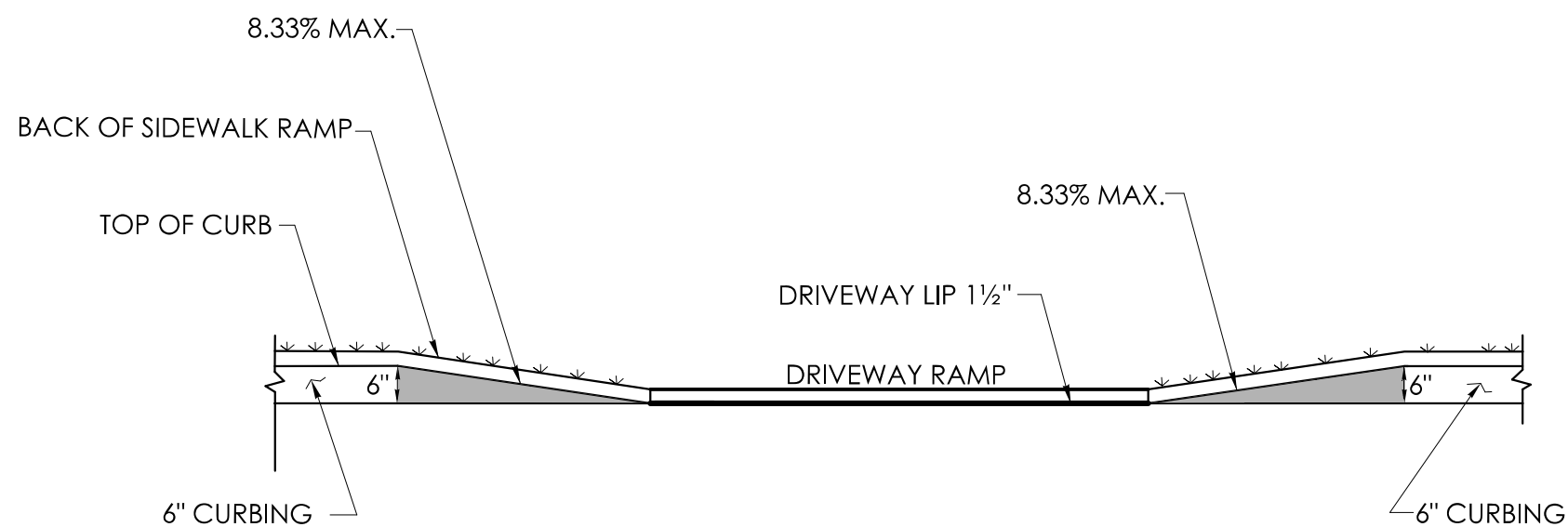
PLAN



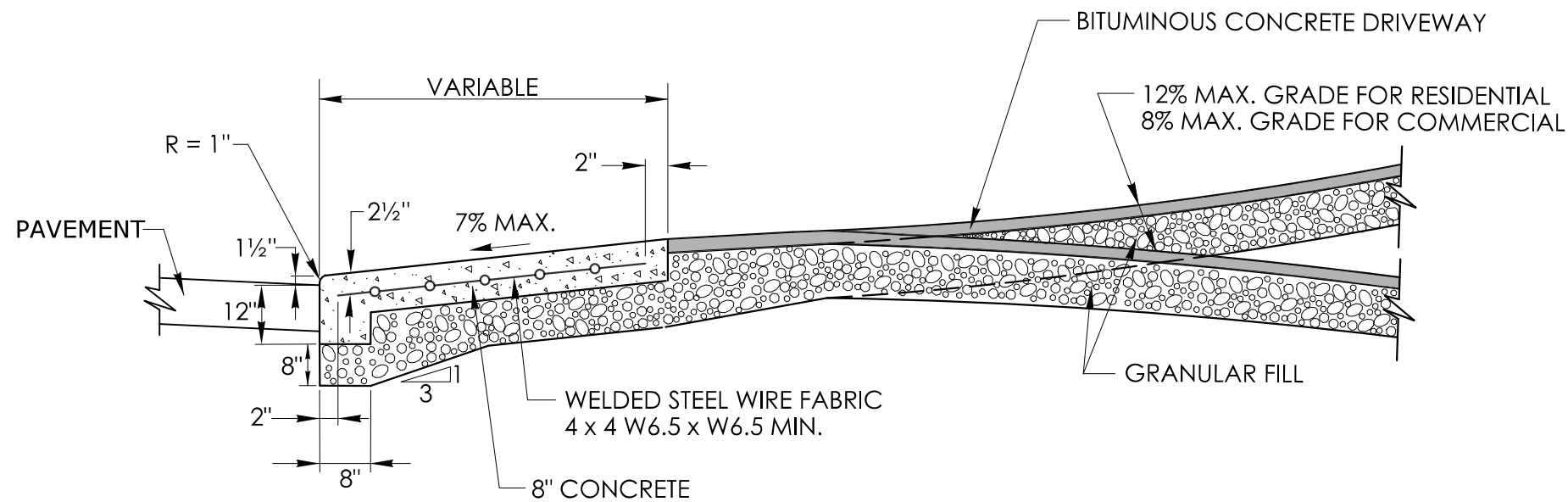
ELEVATION



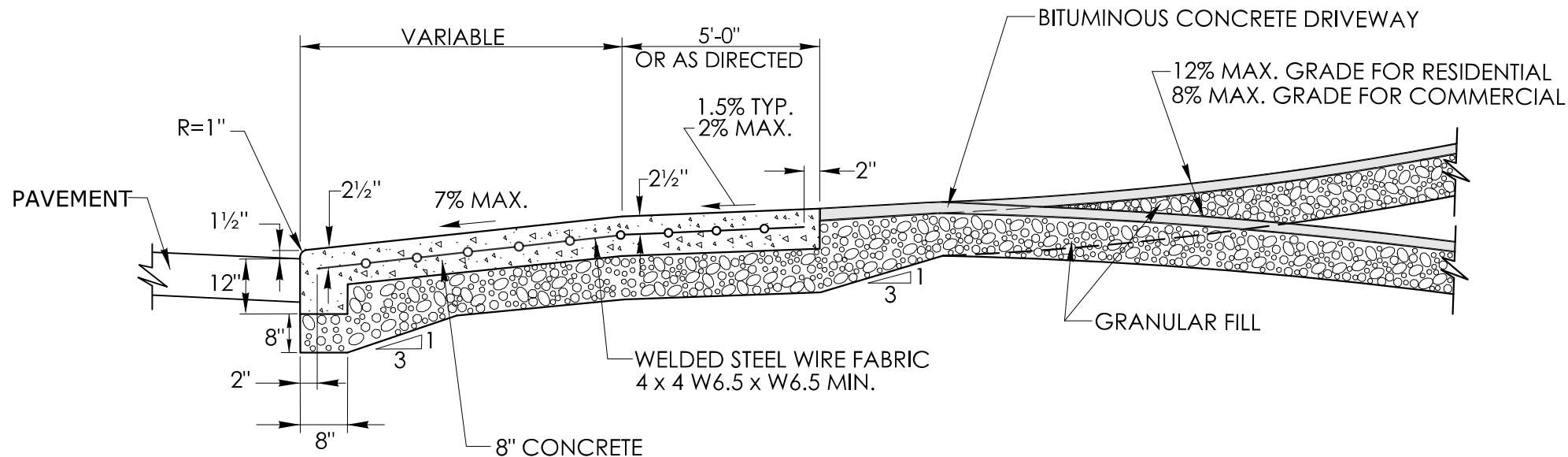
ELEVATION



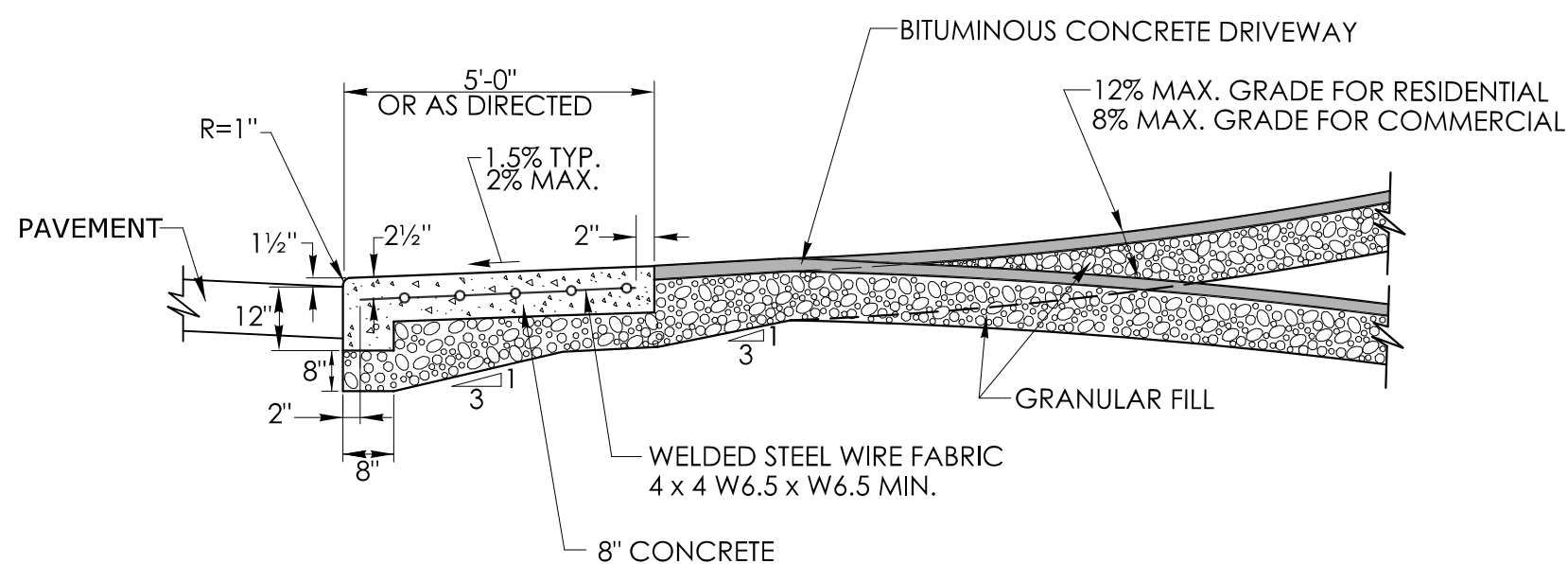
ELEVATION



SECTION A



SECTION B



SECTION C

4/19/24 updated version

NOT TO SCALE

SIGNATURE BLOCK:  
OFFICE OF ENGINEERING  
2800 BERLIN TURNPIKE  
NEWINGTON, CT 06111

SUBMITTED BY:  
*Leo Fontaine*  
Digitally signed by  
Leo Fontaine, P.E.  
Date: 2024.12.19  
15:10:16-05'00'

APPROVED BY:  
*Michael N. Calabrese*  
Digitally signed by  
Michael N.  
Calabrese, P.E.  
Date: 2025.01.29  
12:48:29-05'00'



CONNECTICUT  
DEPARTMENT OF  
TRANSPORTATION

CTDOT  
STANDARD SHEET

STANDARD SHEET TITLE:

CONCRETE DRIVEWAY RAMPS

STANDARD SHEET NO.:

HW-924\_01